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The Commercial Approach to Government Operations

J. G. CUCKNEY, Property Services Agency, DOE

The following is a transcript of a lecture given by Mr. J. G. Cuckney, Chief Executive of the Property Services Agency, in London on 18th June 1974. The lecture was one of a series organized by the Civil Service College under the heading 'Some Management Problems in the Civil Service'. —*Editor.*

With it being the open season for shooting Accounting Officers, and an imminent appearance before the Public Accounts Committee in prospect, I feel rather like a poacher being asked to address a meeting in the presence of the head gamekeeper.* However, the subject about which I am to talk is happily one which interests me intensely, and having pursued a somewhat zigzag course between public service, the private sector and back into public service, I have experienced both sides of the coin, and now after two years with the PSA I am coming to some fairly firm conclusions about the commercial approach to Government operations.

The main import of my talk is:

that the suitability and applicability of the commercial approach to Government operations has probably been over-rated;
that greater respect needs to be paid to the fundamental dissimilarities between public service and private sector operations;
that considerable care needs to be taken to ensure that the introduction of the commercial approach does not damage the high standards of British public service; and
that there is a unique opportunity for the Service itself to develop its own body of management practice and theory and its own management ethos for the very large area of non-policy-making Government activities.

It is nearly six years since Fulton reported, and as you know, one of the central themes of the report was the need for the breaking down of barriers between Whitehall and the world of industry and commerce, the need for a greater two-way flow of people and ideas, and the need to foster more deliberately and consciously in the Government service the management skills needed to direct and control the processes of modern government. For instance, in the summary of main findings it said, 'Too few civil servants are skilled managers'.

I myself do not think that before 1968 the quality of management in the Civil Service was poor, or that the Civil Service was lagging behind the private sector in the development of new management skills

* Sir David Pitblado, KCB, CVO, Comptroller and Auditor General, chaired the meeting. — *Editor.*

and techniques. Far from it; there is no doubt, for instance, that the Civil Service has itself been a pioneer in important fields, particularly on O & M and Operational Research, and in developing a high standard of staff relations through the Whitley Council machinery.

But Fulton did give a jolt—and a jolt that was needed—in the direction of modernizing the structure, procedures and practices of Government so as to make it better able to cope with the changing tasks facing it.

At the turn of the century the Civil Service numbered less than 50,000 people. Today it numbers over half a million, excluding industrials, a growth reflecting the enormously greater intervention of the state in the life of the nation both in economic and social fields. This growth has been associated with an increasing volume of executive, professional and technical work in Government.

It was against this background that Fulton re-appraised the role of the Civil Service in this country and what was required in contemporary conditions for its fulfilment; and it was in relation to the executive work of Government, where the explosion in the growth of the Service took place, that it saw some of the main opportunities for applying a commercial or quasi-commercial approach with advantage. Then in June 1970 the last Administration appointed a special team of business men to advise the Government. This team was led by Sir Richard Meyjes, and some of the principal developments in applying the commercial approach to government stem from its work.

Fulton also saw considerable scope for 'hiving off' executive activities of Government and entrusting them to semi-independent public agencies. It was thought that, in so far as executive work could not be hived off in this way, it should be organized as far as practicable within units of accountable management. 'Accountable management' according to Fulton (Volume 1, Chapter 5, of Report, paragraphs 150–156) 'means holding individuals and units responsible for performance measured as objectively as possible. Its achievement depends upon identifying or establishing accountable units within Government Departments—units where output can be measured against costs or other criteria, and where individuals can be held personally responsible for their performance.' Fulton also went on to say that accountable management entailed identifying particular convenient groupings of parts of an organization to form centres for which costs could be allocated as the responsibility of the man in charge, and it also said (to quote again): 'The manager of each command should be given clear-cut responsibilities and commensurate authority and should be held accountable for performance against budgets, standards of achievement and other tests.'

Now, although we have in existence two notable 'hived off' bodies in the Post Office and Civil Aviation Authority, and although the work of the business team has also led to the setting up of the new Employment Service Agency and Training Services Agency (under the Manpower Services Commission), I think it fair to say that the original

expectations on the possibilities for 'hiving off' have been disappointing. This is in part because even in those fields of Government where the executive and managerial elements predominate, Parliament and Ministers are reluctant to lose control over the constituent elements of spending programmes; over, for example, the environmental aspects of public works projects, and over the prestige and other international implications of major technological innovations and developments. This last aspect is particularly obvious in the field of aviation. Also, a 'hived off' body should preferably be revenue earning and financially self-supporting, or hiving-off becomes rather bogus.

The emphasis has, therefore, turned to developing accountable management in Government in ways which do not involve the removal of executive work from ultimate ministerial responsibility but nevertheless allow it to be managed with a marked degree of independence in practice. The main new concept to emerge is that of the departmental agency—an agency representing an identifiable, partially separate unit of administration within or without a Government Department, with its own Chief Executive who is the Accounting Officer, and who has direct responsibility to Ministers, and exercises substantial delegations in establishments matters. If the agency is within a Department, this arrangement has the advantage of relieving the Department's central policy-makers of a good deal of executive work, to which others specially appointed to it can give their undivided management attention. At the same time, the retention of departmental links ensures that the agency operates in accord with departmental policies. Civil Service Department somewhat cautiously suggest a definition of a departmental agency might be: 'A departmental agency is an organizational entity under its own executive head, either part of a government department or a corporate body within the departmental framework, acting at the direction of a Minister who is answerable to Parliament for its activities and staffed by civil servants (as at present defined) but distinguished from the conventional pattern of departmental organization by having its own executive head and accounting officer, and by a large degree of freedom in staff management.'

The further development of the departmental agency was another result of the work of the Business Team. In April 1971 a report by a project team under Sir Derek Rayner, a member of the Business Team, led to the setting up of the Procurement Executive, which is an agency within the Ministry of Defence responsible for the procurement of all defence equipment. A procurement task of this nature was a clear candidate for organization in this way.

A further major development was the setting up in September 1972 of the Property Services Agency of which I am Chief Executive. The decision to establish this Agency was taken in the light of reports by two other members of the Business Team, Mr. Herbert Cruickshank and Mr. Timothy Sainsbury, and of an interdepartmental working

party called the Working Group on Common Services. Mr. Cruickshank's report had been concerned with construction activities of Government and Mr. Sainsbury's with property management.

Before talking about the PSA itself as an example of a departmental agency, I should like to say that I am convinced the departmental agency concept is a valid one, and, I should have thought, capable of further development and extension.

Now turning to the PSA, it was formed within the Department of the Environment to take over a wide range of responsibilities originally carried out by the former Ministry of Public Building and Works. It has the job of providing, equipping and maintaining a wide range of buildings and installations for Government Departments, the Armed Services and the Post Office. It also manages the greater part of the Government's land and property at home and overseas, and the scale of its operations can be judged from the fact that it has currently in progress work to the value of about £1,550 million and a staff of 56,000 with 12,000 overseas. The Supplies Division of the PSA is responsible for the design, purchase, installation and maintenance of a vast range of office, domestic, laboratory and museum furnishings and equipment.

The setting up of a departmental agency provides a framework within which accountable management can be more intensively developed. Essential to this is a clear structure of command with clearly defined responsibilities. To assist me in managing the PSA as a whole I have a Board comprising my Deputy Chief Executives (DCEs), Principal Establishments Officer, Principal Finance Officer, other senior managers and two 'outside' members from the private sector. The Deputy Chief Executives (Deputy Secretaries) themselves have their own Boards which include the Directors at Under Secretary level immediately below them, and this arrangement provides the machinery for a participative style of management which still leaves the responsibility where it belongs. I attach a lot of importance to the Board structure and its use as a management technique. If one wanted a commercial analogy, the main Board operates like the parent Board of a holding company, with the DCEs' Boards acting as the operating or 'trading' company Boards. Board papers and minutes receive a wide circulation down to Assistant Secretary level or its equivalent at Headquarters and to all Directors of Regions at home and overseas. This has resulted in anticipatory action being taken 'down the line', it acts as a cohesive factor in a large and geographically widespread organization, it has a valuable educative effect, widening management horizons especially at DCE Board level, where we have a 'cross-posting' of directors who serve on other Boards to those to which they functionally belong.

Management is said to be blind without tools for measurement and, were it a science and not an art, this would be true; of course, the enhancement of the quality of management is difficult to achieve

unless one can in some way measure that quality. A vital aspect of our early work in the PSA has been the application of a computer-based staff costing system adapted from the private sector, which is delightfully styled PATOCAP (Professional and Technical Office Control and Analysis Programme). This gives us general information by categories of work and by units of command on what works projects are costing us; the information carries a built-in comparison with private consultants' scale fees and is used as a basis for appraising the ways in which we use our own staff and those in which we use consultants, the aim being to give satisfactory service at lower cost.

In addition to developing our costing techniques we are studying the possibilities of charging other Government clients for our services, or at least securing a better attribution of cost. Lastly, both the Post Office, who are our main 'voluntary' repayment client, and the PSA are engaged in studying the relative advantages and disadvantages of continuing our services to them. The Post Office as part of their study are seeking to compare our costs with those which might be incurred by a commercial organization in this field. Should, incidentally, it be decided that our ways should part (which I would regret) it would take about seven years to disengage because of the volume and nature of work we have in hand for them.

Perhaps the closest we have got to applying a commercial approach to government is in the arrangements which are being made under the Government Trading Funds Act 1973 to operate certain services on the basis of a trading fund instead of the normal practice of treating such costs as an 'allied service' for which funds are voted. The services initially designated for this purpose are the Royal Ordnance Factories, the Royal Dockyards, the Royal Mint, Her Majesty's Stationery Office and the Supplies Division of the PSA.

Broadly speaking, what this amounts to in the case of our Supplies Division is that it will supply goods and services to its clients for repayment and will be expected to balance costs and receipts. A firm of management consultants is at present engaged in helping the Division to set up the necessary system of accounting, which is a very costly business with such a complex organization. It will ultimately only be truly commercial if clients have freedom of choice, to which in a central Government context there are several major objections.

But the rest of PSA's work cannot be organized on a trading fund basis in this way. What we are accordingly doing is to enhance accountability to the maximum extent practicable while recognizing that this will fall a good way short of full accountable management. Basic to this is an extensive exercise of defining aims and objectives for the key levels of command. At the level of the four Deputy Chief Executives these aims and objectives provide a framework for a system of annual reports which have two functions. The first is to look back on the previous year, the objectives set for that year and indicate progress achieved. The second is to set objectives for the coming year and make

forecasts of developments, these in turn forming a background to the next year's annual reports.

However, there is one area where a more commercial approach to Government operations applies particularly in the PSA. We manage a large part of the Government's civil estate and we manage the Defence estate for the Ministry of Defence; and one of the main aims of setting up the Agency was to develop more effective and economic policies for the use of Government property.

As a major step in this direction we have set up within the PSA a special Property Review and Development Group; this is making a selective review of Government lands and property to see whether they are being put to the most effective use. In the absence of a profit motive, and the spur of the market, it is dangerously easy for Government to slip into a wasteful use of its own property. Assets may come to be under-used and those under-using them may well resist change because at best it may offer nothing for them and at worst some sacrifice. It is often suggested that it would be more 'commercial' if accommodation was provided on a repayment basis. It sounds superficially attractive to make departments pay rent for the buildings they occupy. I do not find it attractive for many reasons, especially reasons peculiar to the problems of central Government. Although our present Allied Service method is capable of improvement by, for instance, a more realistic attribution of cost, to go over fully to a repayment basis would detract from the efficient and flexible use of resources, increase the amount of accounting and clerical staff and prevent the economic use of expert staff in short supply. Sudden machinery of Government changes, as only too often seem to occur, really do demand the central control of all accommodation resources, and without such control it would make it difficult to ensure national standards were adhered to.

If I were to sum up the thread of the commercial approach which runs through all this, I would say it lay in counting the cost. Whatever the special features of Government administration, there is never any excuse for not counting the cost when choosing between policies and seldom any excuse for not counting the cost when acting in the field. Economy in execution must always be a central aim of Government.

I have so far in my talk concentrated on the ways in which we have been seeking to apply useful analogies and lessons from the private sector. That this process has been beneficial is, I think, clear. Equally, however, I think it is becoming clear also that the expectations in this direction which were aroused at the time of Fulton were excessive. The pendulum has, in my view, swung too far from the traditional system and style of Civil Service management to a fallacious and even dangerous assumption that standards of Government cannot but be improved by harnessing organizational forms and procedures borrowed from the private sector, and by giving individual civil servants something approximating as near as may be to a profit motive (yet incidentally without the personal benefit—but more of that aspect later!).

I have referred already to the political and other obstacles in the way of hiving off functions of Government. These factors also radically condition the forms of accountability which can be developed within Government. What we do in the PSA is the subject of continuing political interest, not only from the involvement of public funds but also, and increasingly, from the environmental standpoint. Inevitably, in times of financial stringency the spending of the PSA must be affected by cuts in public expenditure, and it is not realistic to suppose that Ministers will be content solely to reduce the total scale of programmes. Both the public at large and Parliament are liable to be critical of individual public works projects undertaken at such times. (We are all familiar with the reaction of the man in the street to the sight of new public offices being put up at a time when he thinks that the money would be better spent on the more needy and deserving.) From the environmental standpoint there is keen public and political interest in all our major work in London and in a good deal of it in the provinces and abroad.

Moreover, our position in relation to our clients is very different from that of an organization in the private sector providing similar services. While we do have some voluntary clients who can go elsewhere if they are dissatisfied, our main clients are Government Departments and they are tied to using our services; equally we are tied to supplying them; whether we like it or not, we have to serve them to standards laid down for the Government Services as a whole, and it is not open to us, for instance, to decide for economic reasons that it is better to stop providing certain types of supplies and to concentrate on others; nor, if we are faced with the urgent need to make good bomb damage either in Northern Ireland or in London, is it open to us on economic grounds to delay or skimp remedial works.

And so the aims and objectives of the PSA which are the basis of accountable management cannot be defined in exclusively quasi-commercial terms. They must reflect political and environmental considerations and the satisfaction of our clients' needs.

It will, I think, be apparent to you without my labouring the point that these considerations rule out neat definition of spheres of accountability in the PSA. No one can be held fully accountable for a particular unit of organization if he is liable to frequent intervention from higher authority; if he has little control over the factors affecting his performance; if, for instance, a particular public works project in London proves appallingly expensive because of Ministerial decisions to delay it, those managing the project can hardly be held responsible. Morever, since our main clients are tied to us we cannot measure the degree of their satisfaction with our services by relating it to the custom we command. Basically, we are in existence to facilitate the operations of Government, and the benefits of successful provision of services can in the last analysis only be assessed in relation to those operations. Finally, it is clearly impossible to measure quantitatively the degree to

which the Agency is successful in conserving the environment when it carries out works.

Even therefore where, as in the case of our Supplies Division, it is possible to apply commercial methods and standards as a measure of performance, we have to be careful to qualify any assessment we make in the light of other, less tangible considerations; and there are obvious risks in public service in encouraging a narrow, competitive concentration on satisfying precise performance indicators.

I am, as you would expect, one of the last people to belittle the significance of the profit motive both within the private sector as a whole and as a factor within the minds of individual managers in industry and commerce. Clearly it is the dominant motive and one which entails related definitions of measures of performance and a highly competitive approach in many fields between individuals seeking to maximize returns on their effort. But I do think that there are some serious risks in seeking to organize Government so as to create similar types of conditions for civil servants. Of course it is only right and healthy that civil servants should seek to fulfil their aims and objectives and an element of competition is implicit in this, but the Government Service would be very much poorer in quality than it is today if the desire to optimize personal performance became the sole and dominating motive among civil servants.

So much work that has to be done in the public service, both in the policy and the executive fields, cannot be carried out successfully by individuals behaving in a highly competitive way. In policy and legislative work, in particular, collaborative effort is essential, and this can only be achieved if personal desires to excel—and be seen to excel—are blended and modified by other motives. For example, success in preparing a Parliamentary Bill may demand a team effort on the part of a formidable range of individuals and units of organization, and unless some individuals and units are prepared to sink their differences and to do work which may give them no particular opportunity to shine, a successful overall result may not be achievable. The same may well apply to the implementation of the Bill provisions once they have become law. It is also essential that individuals should not always be looking to notch up short-term evidence of success, and that they should not be continually seeking out jobs in which it is easy to shine while shunning jobs where the best that can be done may never look very startling (as in, for example, tackling problems of river pollution).

It is my fear that if in the Civil Service we come to place too much emphasis on performance indicators and precise tests of individual merit, these by being too simple and artificially personalized will distort performance so that personal success is pursued at the expense of the common good. I think the risk of this would be particularly serious if, for instance, individual managers within the Civil Service had power to administer financial rewards for successful performance by their staff. Yet 'true' commercial-type accountable management depends

largely upon the ability to hire and fire and to reward personally exceptional performance. I would not like to see two types of public servant develop—it would, for instance, make cross-postings difficult—that is to say, the collaborative type and the competitive type. I also think that perhaps not enough attention has been paid to the nature and extent of the public accountability which already exists and has always existed in the Civil Service. This can be adapted and turned more than has happened in the past to being an aid to management and a management tool. In the PSA we have at Board meetings a quarterly review of follow-up action taken on matters which have come before the PAC. We are also developing our internal audit operations now to include a Professional and Technical Audit in addition to the accounts and finance audit. I believe that in all departmental agency areas of work there is a need for a more highly developed role for audit as, in a way, a substitute for reaction to market forces in a true commercial context. The only warning I would make is that it is essential that audit work is seen as an aid to management and not resented by it. This calls for careful handling of internal audit reports and high quality staff in audit teams.

And so, looking to the future, I see dangers and disadvantages in a thoroughgoing commercial approach to Government operations. I favour instead a more cautious and empirical approach, an approach which seeks a cross-fertilization between what is best in each field and which yields at the end of the day new forms and procedures of Government which reflect more acutely political realities and the special constraints to which Government is subject.

I see departmental agencies as assuming increasing significance as a compromise between the advantages of independent management of executive work and the need for that work to be conducted in conformity with Government policies. I see increasing significance in applying computer-based information systems and costing techniques; and I see an increasing role for the development of related audit arrangements and techniques to provide the incentive to economy which, in the private sector, might be expected to come from the profit motive and the concern of shareholders. This development of audit is a natural extension of the existing interest of Public Accounts Committee in the operations of Government, and that interest reflects in turn the interest of Parliament as a whole and the public in economical standards of public service.

The changes of organization and method emerging from this process I see as aiding and supplementing rather than replacing the more traditional forms of organization and procedures of Government. The aims and objectives of management in Government cannot be reduced to quasi-commercial terms and must reflect the wider needs and policies of Government. I think, moreover, we must be careful that in stimulating management through financial and other performance indicators we do not erode the sense of public service in our public servants.

Integrated Forms Handling Equipment for Services Pension Books

MAJOR R. F. MAY, RAPC, Ministry of Defence

Introduction

The benefits gained by the introduction of Automatic Data Processing (ADP) are often negated by the bottlenecks which occur in dealing with the paper output. Paper handling technology is now being improved in an attempt to overcome this problem and the following article is one example of how modern machinery can be used to speed up paper handling procedures.

Background

As a result of a study into the feasibility of applying ADP to the assessment, maintenance and payment of pensions to ex-servicemen, it was decided that a common ADP system should be introduced for the maintenance and payment tasks of RN and RAF pensioners.

The predominant method of paying those pensioners receiving weekly paid pensions is by means of a Pension Order-book (POB) usually containing 52 foils which the pensioners cash at the Post Office as they become due for payment. As originally conceived the POB is a good way of paying the weekly pensions. It has the benefit of being reasonably secure from fraud, it is easy to account for the foils at the Post Office counter and it is easily understood and popular with the pensioners. However, there were some disadvantages in that the books used required the cover to be completed with the pensioner's particulars and the weekly payment foils to be stamped with the amount due and the date for payment. Whereas a few years ago most pensions were fairly static and a POB would normally be issued only once a year, today, more and more pensioners are liable for tax to be deducted from their pension and are therefore affected by alterations to their personal allowances and by Government tax changes. This, together with adjustments for those pensioners entitled to receive annual Pension Increases (PIs), made it necessary to issue replacement or supplementary books. Where the revised amount for issue was a reduction, the existing POB was recalled from the pensioner and the uncashed foils in the book were overstamped with the revised rate or a new book was issued. The normal annual replacement of POBs was staggered according to initial letter of the surname; however, replacements for PI reviews and budget tax changes caused unavoidable peaking of the workload since these were effective from the same dates for all those concerned.

A few years ago the RN pensions issuing authority, a department of the Directorate General of Defence Accounts (DGDA) at Bath, did introduce a degree of automation into the preparation of the POBs. Using an ICL 1300 computer system they maintained a card file of their pensioners and an output of this system was a printed list of names, addresses and rates. By means of a heat-transfer printer this list was used to put a carbon image onto the covers of the POBs. The payment foils within the books still had to be rated and dated by hand and during peak workload periods temporary Clerical Assistants were specially recruited to carry out this task. This same book preparation procedure was continued when the RN pension payment work was transferred to an ICL 1904A computer system in 1971. It was becoming more and more difficult to recruit suitable temporary staff and the decision to combine the RN and RAF pensions task at Bath would only have increased the problem. Also, the heat-transfer printer being used was old and required replacement. For these reasons it was considered necessary either to find an alternative to the POB or further automate the production of the order-books. As an acceptable and economic alternative to the POB could not be found the latter course was investigated.

New system

In designing the combined RN/RAF pension system it was decided that the following requirements were desirable:

(*a*) Supplementary books should not be issued as the Post Office make a standing charge for each 1,000 foils cashed and the extra cost of pensioners having more than one POB was estimated to be in the region of £28,000 per annum.

(*b*) Whenever possible a new POB should be issued to expire the payment week before a known change in the amount for payment will occur, thus obviating the need to check returned books for uncashed foils. This entailed abandoning the existing system of renewal cycles and arranging that expiry and renewal coincided with the known peak issues of PI reviews and, where possible, tax changes. For instance, if a new POB was issued for any reason to a pensioner who was known to be entitled to receive Pension Increases, the POB issued would expire the week before his annual PI was due. To accomplish this POBs would have to contain a variable number of weekly foils.

(*c*) Work on preparing POBs at peak workload periods, either manually or using the semi-automated system, had to start up to three months before the revised payment was due. Since, during this period, changes could occur which entailed amendment to the POBs already processed, it was desirable to find a quicker method of producing the books. If this could be done it would not only reduce the preparation period and therefore the number of changes occurring in that period but also help achieve (*a*) and (*b*).

A team from DGDA Acs 21c (O and M studies; machine and office aids; forms design advisory service) were asked to examine possible methods of mechanizing the production of POBs. The team found that the options to be investigated were limited because of the lack of suitable equipment available. They considered three possible processing methods:

(*a*) Partial mechanization by modernizing and improving the heat-transfer system which was currently in use for the RN pensions.

(*b*) Partial mechanization by adopting the same system as that used to produce the Army pension and allotment books.

(*c*) A fully mechanized process similar to the flow-line system which has been used in Newcastle for a number of years by DHSS for producing Post Office order-books for Social Security payments.

On further investigation it was found that the flow-line machinery in the third option above was not readily available and that the manufacturers would only be prepared to entertain an order for a minimum of five machines. Alternative fully mechanized systems were sought, but only two were found and the agents for one declined to quote.

Alacra Limited, Business Equipment Division, produced a proposal to use a BÖWE (Böhler & Weber KG) 117 Machine Arrangement to do the work. After this system and the partially mechanized systems mentioned above had been evaluated, the team recommended that the BÖWE 177 system be adopted for the following reasons:

(*a*) It was expected to be the most economic system in the long term. The cost of the extra staff required for the alternatives would more than offset the one-time capital outlay for the machinery needed.

(*b*) The problem of recruiting suitable temporary staff, at an ever increasing cost, to handle the peak workload periods with the partially mechanized systems, would be avoided.

(*c*) The system is faster and there is room for further expansion.

BÖWE 117 system

The BÖWE 117 Machine Arrangement is a high-speed integrated forms-handling system. It comprises the following:

2 BÖWE 302 Guillotines—each fitted with a longitudinal cutter and a BÖWE 8002 Optical Mark Recognition (OMR) device;
1 BÖWE 4502 Dual Sequencer (2 BÖWE 4501 Sequencers linked by a transport device);
1 BÖWE 4802 Assembly Station;
1 BÖWE 4601/2 Twin Stapling Device;
1 BÖWE 5505 Conveyor Stacker.

These units are linked on-line to form a continuous operation (*see figure* 1). This is a two-channel system producing Pension Order-books

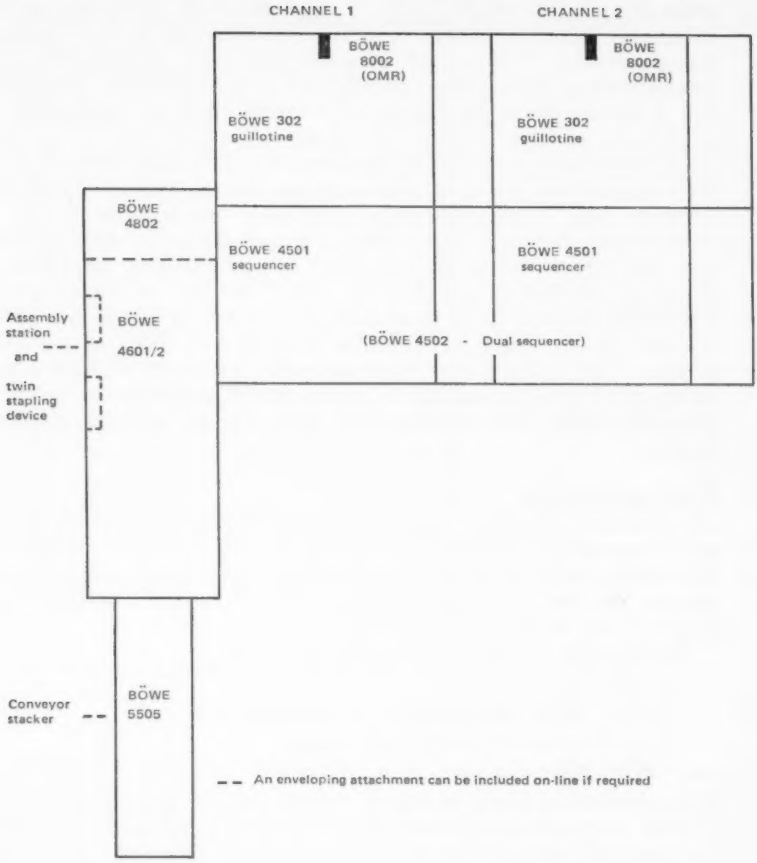


Figure 1 - BÖWE 117 configuration

by processing simultaneously two different webs of continuous stationery. One web comprising the book covers and notes to the payee, the other web being the pages of weekly payment foils. The stationery used for the covers is naturally made of thicker paper. Both continuous webs are cut into single forms of equal size and passed to the dual sequencer. These forms are then assembled according to a pre-determined sequence. Subsequently they are stapled into complete books and transported to the conveyor stacker. In order to match the pages of foils correctly with the covers, the OMR devices attached to the guillotines are used to read and check the parity and end of group marks previously recorded on the forms by the computer printer. All these procedures are controlled and monitored, the pre-determined sequence and number of pages per book being controlled by an exchangeable printed circuit program card while the OMR devices scan the control marks to ensure the correct assembly sequence. An electronic counter checks that the correct number of documents are assembled in each book produced and photocells check the correct transport of the forms from station to station throughout the whole process. The system stops automatically on faulty control marks, wrong number of forms, end of paper and on stapling and document transport faults, thus ensuring that there are no wrongly assembled books.

Book production

The formats of the book covers and payment foils are shown in *figures* 2 *and* 3 respectively. The web containing the foils is fed into channel 1 of the machine and that containing the covers into channel 2. The operator ensures that the book serial number printed on the first front cover matches that on the first set of foils.

The machine makes up the books as follows:

Front cover;
From 2 to 26 pages of foils (in multiples of 2);
Page of guidance notes to the payee;
Back cover.

When processing starts, the control mark indicating the front cover of the first book is read and stored, this cover is then cut and transported to the assembly station. Processing then passes to channel 1 from which pages of foils are selected and moved to the assembly station. When the page containing the end of book control mark has been assembled, processing returns to channel 2. The page of notes and the back cover are then selected and, provided the control marks are correct, these are also assembled. If the number of forms assembled is right the whole book is passed to the stapling unit and then to the conveyor stacker.

Control marks

Currently only one control mark is used in this application although

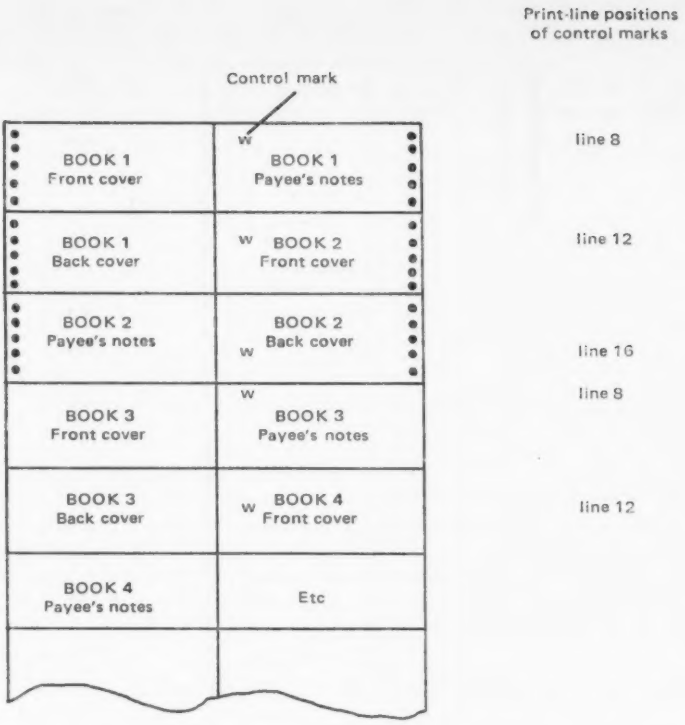


Figure 2 - Stationery pattern for book covers and notes (Channel 2)

additional marks can be used for more sophisticated process control. The sequence of selection and matching of complete books is achieved by the control marks appearing in different positions on the forms. The letter 'W' was selected as the control mark since this fills more of the area checked by the Optical Mark Recognition device than would be the case for most other characters. The optical devices used are not true character readers and only recognize the pattern of the mark as a black on white image, storing this for comparison purposes.

As shown in figures 2 and 3, the control marks are positioned by the computer printer as follows:

Pages of covers and notes
The control mark is printed on the 8th print-line of the block comprising the front cover and the notes page for the first book.

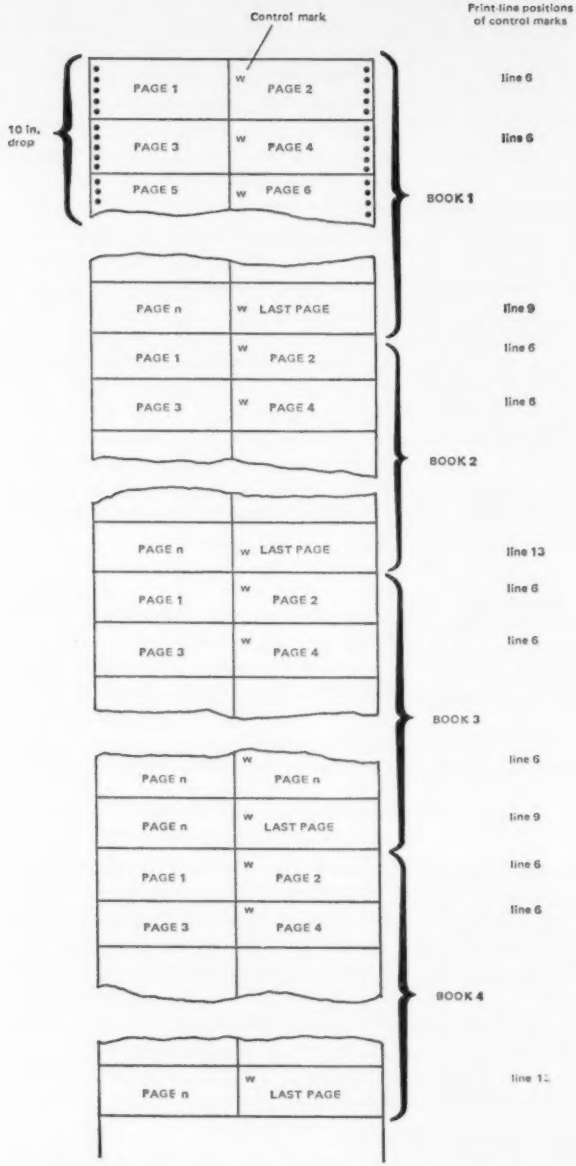


Figure 3 • Stationery pattern for payment foils (Channel 1)

The control mark is printed on the 12th print-line of the block comprising the back cover of the first book and the front cover of the second book.
The control mark is printed on the 16th print-line of the block comprising the notes page and the back cover of the second book.

The pattern of printing control marks described above is repeated until the details for the last book have been printed.

Pages of foils
For the first book the control mark is printed on the 6th print-line on each pair of pages up until the last pair on which it is printed on the 9th print-line.
For the second book the control mark is again printed on the 6th print-line on each pair of pages except the last on which it is printed on the 13th print-line.

This pattern is repeated until the foil details for the last book have been printed.

Procurement and installation
The order for the BÖWE 117 system was placed on 30th May 1973 and the delivery date quoted at that time was February 1974. The equipment was installed at Bath on 23rd January 1974, following an initial acceptance trial by HMSO at the BÖWE factory in Germany on 12th December 1973. A further trial by an HMSO Safety Officer was carried out on 6th February 1974 and the following safety features were requested:

(*a*) The mains earth conductor should be terminated on the machine chassis.
(*b*) A perspex guard should be put over the book assembly station.
(*c*) In order to prevent access to moving components and/or live terminals, various cover panels should be secured so that their removal can only be effected by means of a tool.
(*d*) Acoustic covers should be fitted to reduce some of the machine noise.

The first three items were quickly implemented by Alacra and the acoustic covers are being manufactured at the BÖWE works. On-site training of operators took place on 14/15th February, and the system commenced operational work on 25th February 1974.

The BÖWE 117 system was expected to give a throughput in the region of 1,000 books per hour, depending on the number of payment foils in the books. The best achieved so far has been 930 per hour but this will possibly improve as the operators become used to handling the equipment. Some teething troubles were experienced with form wrecks. This was found to be due to the stationery having been packed and transported in the wrong size boxes because of a shortage of boxes of the correct dimension caused by the three-day working week. The forms

became distorted and buckled in transit and, although they processed through the computer printer and the first stage of the guillotines quite satisfactorily, once they were cut into single forms the buckled paper would not go through the sequencers to the assembly station correctly. Now the cause of the trouble is known the necessary steps have been taken to avoid re-occurrence.

Other systems

This is the first BÖWE 117 system to be installed in the UK, but it is understood that two other Government Departments are installing similar systems. DHSS have ordered two systems for use at their Fleetwood office to handle the payment of weekly paid War Pensions and Attendance Allowances; and the Paymaster General's Office at Crawley have ordered a system to make up order-books in respect of the 100,000 weekly paid Public Service pensions for which they are responsible.

Long-term Planning in the Netherlands

E. D. J. KRUIJTBOSCH

The article that follows is based on a talk given to the British Institute of Management (London Branch) on 2nd April 1974. The author discusses the role of the Scientific Council for Government Policy—the Dutch 'Think Tank'. Mr. Kruijtbosch is Secretary of the Council. —*Editor.*

Introduction

This article focuses on the terms of reference and activities of the provisional Scientific Council for Government Policy. As this Council has an important part to play in the government planning process, it is necessary to begin by outlining the meaning of planning in the Netherlands and to sketch the development of government planning before and after the second world war.

Government planning function

Planning is a word which is often used, but means different things to different people. It is necessary, therefore, to describe briefly government planning as it has developed in the Netherlands.

Several features of Dutch society have contributed to the kind of government planning which has developed in the Netherlands. First, the Dutch value their individual freedom highly, and have widely differing religious and political opinions (reflected by some 15 political parties). Second, the Dutch economy is based on private enterprise. A

few large international corporations constitute a significant part of Dutch production. The economy is extremely dependent on developments in other countries. It is well known that the sum of imports and exports roughly equals the gross national product. Third, the 13 million Dutch live in an area of about 14,000 square miles, of which one-third was originally marshland. Our living conditions have convinced us that complete freedom leads to national suicide, so we accept although grudgingly some limitation in our personal freedom through a co-operative effort.

Government planning in the Netherlands has three characteristics:

(*a*) *Flexibility*. Most plans must be changed in the course of their execution. We must be able to adapt quickly to changing circumstances.

(*b*) *Alternatives*. With widely differing political views combined in coalition Governments, it is essential that alternatives are generated out of which choices can be made or compromises reached.

(*c*) *Participation*. Unless everybody has his 'say' in the preparation of a particular plan or policy and unless these differing views are incorporated in the project, the chances of its success are small.

These conditions make the planning process in the Netherlands a slow, careful and thorough operation. As we say in the Netherlands, 'We don't skate on one night's ice'.

History of planning

The physical characteristics of the Netherlands led to early forms of communal or provincial planning. Farmers had to co-operate in order to reclaim land from inlets and marshes. The 'polders' were thus the result of a joint planned effort. In the same way some cities in the Netherlands could not be developed without a joint effort to construct the necessary infrastructure. A good example is the city of Amsterdam with its well-known canals running in semi-circles around the centre of the city, the former Town Hall, now Royal Palace at the 'Dam'.

It is said that events occur in the Netherlands 50 years later than comparable events in the rest of the world. The feudal state continued in the Republic until the French revolution. Napoleon forced us to accept a modern centralized state and in the first half of the 19th century King William I, our only mercantilistic (and to some extent absolute) monarch, planned and carried out an ambitious programme of improvement of infrastructure and industrialization. A network of waterways was built and two textile-producing regions were developed. The textiles were sold to the East Indies under preferential agreements.

The last planned effort was carried out from 1840 to 1850 when nearly 50,000 acres were reclaimed between Haarlem and Leiden. Schiphol airport is situated in the north-eastern corner of this former lake. Liberalism too had reached us in the middle of the 19th century and the further development of this 'polder' was left to free enterprise.

Nevertheless, planning and programming persisted in the water management sector ('Waterstaat'). Plans for reclaiming parts of the Zuider Zee were prepared by a private society around 1890. The plans were enacted in 1918 and work started in 1928. The project will be finished by about 1980, the execution being slowed down in the last 20 years because of priority given to the so-called Delta plan, the closing of all sea arms except the estuaries of the Rhine and Scheldt. One other project of the last century should be mentioned: the digging of the Rotterdam ship channel ('Nieuwe Waterweg') by Caland from 1866 to 1872. This channel was of prime importance to the remarkable growth of the port of Rotterdam. Throughout Dutch history major emphasis has been placed on the thorough preparation, planning and programming of infrastructure.

Economic planning was a late starter. Free enterprise was highly valued and lasted up to the great depression, during which the urgent need for economic planning was first clearly felt.

During this period the main opposition party worked out an alternative to the conservative deflationary policies of the ruling coalitions. The plan was called the 'Plan of Labour' and was taken up immediately after the second world war. It formed the basis for the creation of the Central Planning Bureau (CPB) which has become the backbone of economic planning efforts in the Netherlands. Its staff of some 100 econometricians works out yearly short-term projections and five-year medium-term projections. It advises all departments on the economic aspects of their policies and helps to shape a consistent economic policy by supplying policy alternatives to the Social and Economic Council, a major advisory body consisting of experts, and representatives of employers' and employees' organizations.

During the 'thirties the need for physical planning also became apparent. Some cities, especially in the south (Rotterdam, The Hague and smaller cities in their vicinity), were growing dangerously close to each other. During the Occupation a new service was founded to deal with these problems. It is now known as 'Rijksplanologische Dienst' (Physical Central Planning Service).

Present situation and recent developments

The major government planning institutions functioning today all share a common characteristic—that of being to some extent independent services and valued because of their technical know-how. Although a minister is responsible for their activities, he traditionally leaves a lot of freedom of action to the experts involved. The institutions are:

(*a*) *Directie van de Rijkswaterstaat* (*Central Office for Water Management*). This office is responsible for the planning, programming and execution of all water management projects such as land reclamation and port development. It also deals with the expansion and maintenance of a dense network of motorways including river crossings. A separate group within the office is studying a plan for a

second national airport. The major discipline is engineering from Technical University of Delft. The minister responsible is the Minister for Transportation and Water Management.

(*b*) *Cultuurtechnische Dienst* (*Agriculture Technical Service*). This office is responsible for preparing, planning, programming and implementing major projects for the restructuring of agricultural areas (reallotment projects). The major discipline is agricultural engineering from Agricultural University of Wageningen. The minister responsible is the Minister for Agriculture, Fisheries and Food.

(*c*) *Rijksplanologische Dienst* (*Central Physical Planning Service*). This service works out guiding principles for physical planning to be carried out by lower authorities, i.e. the provinces and municipalities. These guiding principles are set out and explained in government reports on physical planning. A fairly elaborate plan was published in 1966 (the so-called second report on physical planning). In December 1973 the first part of the third report was published containing reviews of physical planning policies and a reiteration of guiding principles. In some instances changes in emphasis can be detected. This service has a stronger multidisciplinary character than the other services mentioned here. The minister responsible is the Minister for Housing and Physical Planning.

(*d*) *Centraal Planbureau* (*Central Planning Bureau*). This service undertakes economic planning in the form of yearly projections on which Government policy is based. It is normal practice for an early version of the yearly projection to be submitted to Parliament with the yearly Budget. In 1964 the CPB started medium-term economic projections, the last of which was published in 1968 and covered the period 1968–73. From time-to-time longer-term projections are made. Econometric models are used by CPB as a basis for many of their forecasts and projections. Different alternatives can be evaluated thus enabling Governments to choose between them as they affect different aims of economic policy. The major discipline is econometrics, with graduates from Amsterdam University and Erasmus University of Rotterdam. The minister responsible is the Minister for Economic Affairs.

(*e*) *Some major advisory councils.* An interesting feature of the Dutch government planning process is the importance of some advisory councils. I have already mentioned the *Social and Economic Council*, in which employers, employees and experts meet and discuss major problems and developments. Another council of some importance is the *Physical Planning Advisory Council*. Recently a *labour market council* has been set up with regional labour market councils. The creation of a *central environmental council*, a merger of already existing councils, is being prepared.

The Conservative coalitions from 1959 to 1973 (with the exception of

one short interval in 1965–66) fostered further developments in the planning field. More recent developments are:

(*a*) Greater emphasis on long-term planning. The first medium-term economic projection of the CPB was published in 1966. Its Director published a year later a macroeconomic projection up to 1990. The second report on physical planning of 1966 tried to describe a kind of Utopia in the year 2000.

(*b*) More emphasis on regional planning. I myself have developed a medium-term economic model for the greater Rotterdam region (Rijnmond). An integrated structural plan for the three northern provinces of Groningen, Friesland and Drente, which are lagging economically behind, is being prepared and should be ready for implementation in 1977.

(*c*) The introduction of new methods of policy analysis to some extent inspired by planning, programming and budgeting systems. The last Conservative coalition government set up an interdepartmental committee for policy analysis presided over by the Director-General for the Budget. Its task is to introduce more modern methods of policy preparation in all departments. The committee analyses and systematizes existing policy aims, works out proposals on standards to be applied in cost-benefit analysis, has started the analysis of programmes in some ministries and has organized a first experimental policy analysis course for government employees. There is no school of public administration in Holland but the need to prepare civil servants somewhat better for their jobs is appreciated. The committee has regular contacts with the University of York.

(*d*) In 1966 the Minister for Education and Sciences set up a committee to carry out research into the future structure of society. The committee is better known after its chairman as the 'De Wolff' Committee. In its report the committee analyses the present government planning structure and distinguishes two kinds of planning: sector planning and aspect planning. The diagram opposite illustrates their line of thinking.

The committee argues that the government planning structure in the Netherlands is incomplete and too disintegrated. It gives illustrations of unco-ordinated planning efforts and too strong a reliance on well-organized disciplines like technical and agricultural engineering and econometrics. To improve the existing machinery the committee recommended the setting up of two new bodies:

(i) A Planning Council responsible for the integration of planning effort with particular regard to the longer-term development of Dutch society.

(ii) A Social and Cultural Planning Bureau entrusted with the task of co-ordinating studies and planning effort in the realm of 'welfare' hitherto dispersed over many departments (justice, education, culture, social affairs, etc.).

Aspects	Sectors				
	Water management	Education	Transportation	Defence	Etc.
Economic					
Physical					
Financial					
Social and Cultural					
Statistical					

These recommendations were carried out with minor modifications by the last Conservative coalition in 1973. In 1973 a provisional Scientific Council for Government Policy (equivalent to the planning council) was set up and in 1974 a Social and Cultural Planning Bureau was created.

Scientific Council for Government Policy

The terms of reference of this Council, as described in a draft law now before Parliament, are:

(*a*) To supply the Government with scientifically sound information on developments which may affect society in the long term and draw timely attention to anomalies and anticipated bottlenecks; to define major policy problems and indicate policy alternatives.

(*b*) To provide a scientific structure which the Government could refer to when establishing priorities and which would ensure that a consistent policy is pursued.

(*c*) With regard to studies undertaken in the sphere of research on future developments, and long-term planning in both public and private sectors, to make recommendations on the elimination of structural inadequacies, to further specific studies, and to improve communication and co-ordination.

The Council is a provisional body, set up by Royal Decree pending a decision by Parliament on a proposed law. It is independent. Its members (maximum nine) are nominated for five years by the Crown, and they can be reappointed only once. The Council publishes its reports to the Government, and establishes its own programme of work. Its composition is multidisciplinary and reflects the different ways of thought in Dutch society. At present the Council is chaired by a

psychologist and has five other members: a physicist, an economist, a sociologist, an engineer and a physical planner.

The Council is advised by extraordinary members: the Directors of the CPB, the Central Physical Planning Service, the Central Bureau of Statistics and the Social and Cultural Planning Bureau, and the Chairman of the Committee for Policy Analysis (Director-General for the Budget). It is administratively embodied in the Ministry of General Affairs, this being the cabinet office of the Prime Minister. It is assisted by a small staff of civil servants, again of a multidisciplinary character, headed by the Secretary of the Council.

The reports of the Council, which are published, are submitted by the Prime Minister to the Ministerial Council. Special combined sessions are envisaged between the Ministerial Council and the Scientific Council.

The main task of the Council is to inform the Government on possible long-term developments, thus creating a scientifically based framework for the evaluation of policy alternatives and decisions on policy priorities. The Council reflects; ministers decide. The Council should pay particular attention to the need for an integrated long-term planning effort, and continue the work of the 'De Wolff' Committee on planning the planning process.

The Council's programme and ambitions

The Council has produced its first programme in which three kinds of activity can be distinguished:

(*a*) *Fundamental and on-going activities.* To this category belong three projects:

(i) *A systematic and general survey of the future.* The aim of this survey, which is to be carried out by the different planning bureaux as a joint effort, is to discern long-term trends and discover future problems.

(ii) *A survey of values and norms.* Values change, and their impact on society is considerable, but not much is known about this. Some problems likely to arise in the future can only be anticipated with some knowledge of future values in a pluriform society.

(iii) *External world.* The Netherlands is extremely small in comparison with the countries surrounding it. A thorough analysis of (exogenous) influences in different spheres is necessary.

(*b*) *Policy orientated projects.*

(i) *Systematic analysis of long-term government plans.* The Council envisages studying and commenting on long-term plans prepared by government agencies in order to ensure consistency in government planning.

(ii) *Promotion of a more integrated policy preparation.* The Council has studied present Government intentions and is drawing attention to deficiencies in particular policy fields.

The Council has already published four short reports (on European Union, structure of the Dutch economy, long-term energy policy and long-term environmental policy); and is preparing reports on the labour market, schooling and further education, health and social welfare, and distribution of income, wealth, knowledge and power.

(*c*) *Organizational projects.* The Council is trying to stimulate thought on the organizational structure of government both horizontally (relations between departments) and vertically (relations between central government and local authorities). The Council is convinced that better long-term policies depend to a large extent on an efficient organization of government activities. The Council will pay particular attention to planning the planning process (continuing the task of the 'De Wolff' Committee) and the relations of governmental planning to non-governmental developments and attitudes.

The Council is ambitious, and its task extensive. It knows that within the intricate network of government institutions and services numerous difficulties will have to be met. The Council is, however, confident that its task meets a long felt need and that it may make a modest contribution to the solution of problems succeeding each other in a rapidly changing world.

We endeavour to establish a sound framework in which different long-term policies fall into their proper place. The framework should be scientific. This means that information is collected in an objective manner without regard to specific political preferences. Furthermore, we endeavour to establish an active relationship with institutions and groups both in and outside government, and comparable institutions in other countries. This could be achieved by enabling the public at large, and interested groups in particular, to look in the 'laboratory' in which we are elaborating our views on different questions. It may lead to public discussion of topics, as it has already in the case of the first issue raised—European Union.

We intend to stimulate thought about the future, leaving studies to be carried out by others. We do not want to duplicate, but to function as a catalyst. We therefore want to remain a small and flexible body, able to change its programme and activities quickly as new needs arise.

The Council has only one year's experience. 'The proof of the pudding is in the eating.' At least it can be said that in the Netherlands resources are set aside to provide for the nation in an unknown, but hopefully better, future.

The Whitehall Central Branch Exchange

W. E. HAYES and G. M. ALLISON, Central Computer Agency, CSD

This year, 1974, sees the introduction of a new telephone system in Whitehall. The existing system which has grown up over the years is a complex of manually operated telephone exchanges interconnecting Government Offices via a maze of private wires (tie lines). The new system is an integrated automatic system with Direct Dialling In (DDI), Hold for Enquiry, Automatic Transfer and other facilities to cater for the ever increasing demands on the telephone service. The design of the new system is based on the crossbar type of automatic switching equipment, and push button telephones (keyphones) are used to exploit the faster switching which is one of the advantages of this type of equipment. However, a number of existing conventional automatic exchanges will be incorporated in the system and these will continue to use the familiar dial telephone.

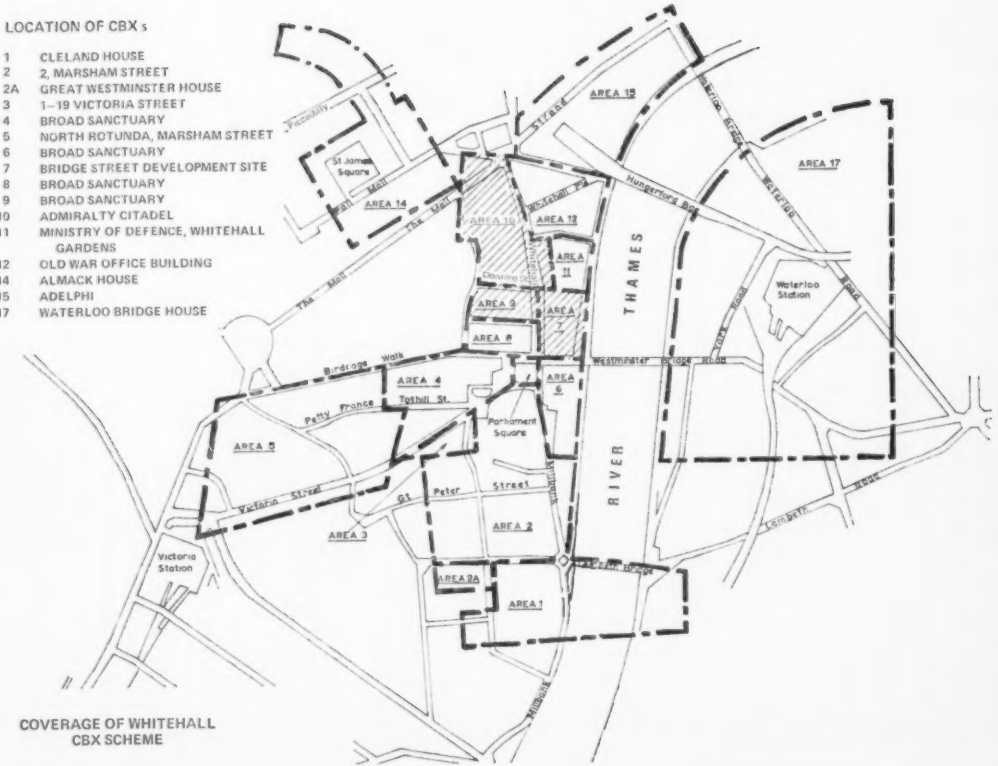
The project began in the mid-sixties when a Post Office study group was set up to consider the future requirements of Government telephones in London. It was evident that extensive rationalization was needed to provide a more flexible system better able to cope with fluctuations in the number of Departments and frequent changes in staff and locations. The new system was designed to make maximum use of the latest automatic switching equipment available, to provide savings on maintenance and to reduce the number of operators required.

The new Whitehall CBX complex covers an area within a radius of about 1,000 yards centred on Big Ben. Most of the major departments are within this area and these, together with the Cabinet Office and the Palace of Westminster, form the main part of central Government within the United Kingdom. Within this area there are some 80 Government occupied buildings served by about 600 operators. The switchboards are interconnected by hundreds of private wires, but, of course, most of the inter-departmental traffic in London is carried by the public network.

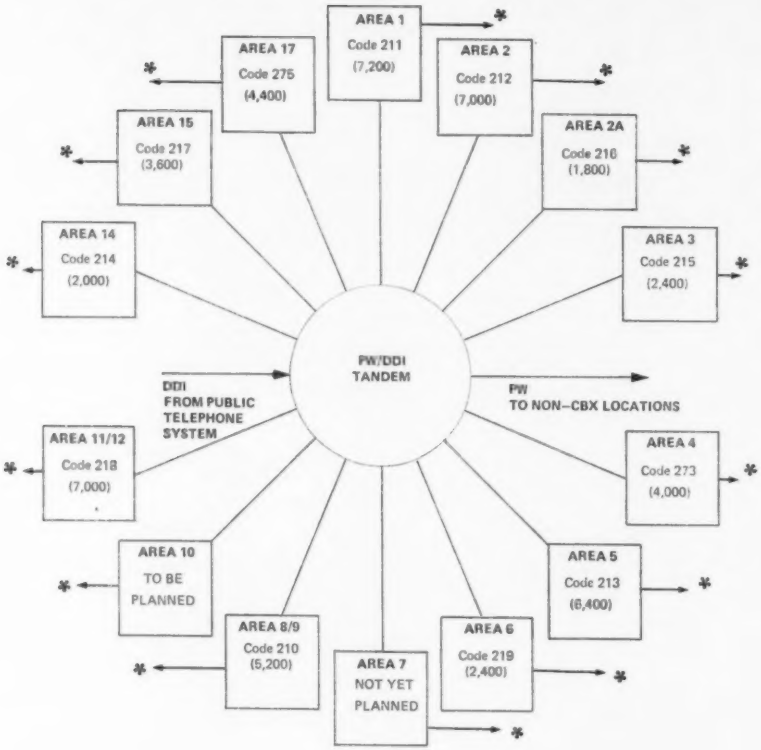
The basic design of the new complex divides the Whitehall area into a number of smaller areas (*see illustration opposite*), with the Government Offices in each area served by an automatic exchange central to that area. Interconnections between areas are made via a central automatic switching exchange known as the Tandem to provide an integrated automatic complex. Because of its essentially multi-departmental role, each area exchange is classified as a Central Branch Exchange (CBX) and the whole system is known as the Whitehall CBX complex.

LOCATION OF CBX s

AREA	1	CLELAND HOUSE
AREA	2	2, MARSHAM STREET
AREA	2A	GREAT WESTMINSTER HOUSE
AREA	3	1–19 VICTORIA STREET
AREA	4	BROAD SANCTUARY
AREA	5	NORTH ROTUNDA, MARSHAM STREET
AREA	6	BROAD SANCTUARY
AREA	7	BRIDGE STREET DEVELOPMENT SITE
AREA	8	BROAD SANCTUARY
AREA	9	BROAD SANCTUARY
AREA	10	ADMIRALTY CITADEL
AREA	11	MINISTRY OF DEFENCE, WHITEHALL GARDENS
AREA	12	OLD WAR OFFICE BUILDING
AREA	14	ALMACK HOUSE
AREA	15	ADELPHI
AREA	17	WATERLOO BRIDGE HOUSE



COVERAGE OF WHITEHALL
CBX SCHEME



* To Public Telephone System

WHITEHALL CBX COMPLEX – SCHEMATIC DIAGRAM

Installation began in the late 'sixties. More than 100,000 square feet of space has been provided by the Property Services Agency for CBX accommodation and it was required that most of this should be above ground. Where sub-ground or windowless accommodation was unavoidable it was agreed that extra efforts would be made to provide an environment as pleasant as possible. This has been a tremendous task.

The automatic telephone facilities provided by the new system will provide many advantages not available to the user in the existing system. For instance, telephone connection throughout the CBX system and also throughout the United Kingdom is available simply by dialling a code. Direct Dialling In, of course, allows direct access to a particular telephone from anyone outside the CBX complex. The Automatic Transfer facility enables a caller from outside the user's CBX area to be transferred to another extension within the CBX area. Similarly, the Hold for Enquiry facility enables an enquiry to be made from another extension within the area and in the meantime holding the original caller from outside the area.

Since the Post Office is now a public corporation and no longer directly accountable to Treasury and since the new system is multi-departmental, the authority for the planning and management of the CBX complex has become the responsibility of the Civil Service Department. These activities are carried out in the Telecommunications Division of the Central Computer Agency in CSD. The Whitehall CBX complex has become a central feature for promoting better utilization within government administration of all the new equipment and techniques available in the telecommunications field which is the major role of the Telecommunications Division.

Representing the complex the schematic diagram opposite shows the Tandem exchange at the centre and the area CBXs connected to it via radial lines, indicating cable links. Thus, any telephone in any area can be connected to any telephone in any other area simply by going via Tandem. The ultimate capacity of the equipment in each area is shown in brackets in the area boxes. Eventually the system will cater for about 80,000 telephone users in the Whitehall area.

To communicate with people outside the Whitehall CBX, both within the London area and throughout the United Kingdom, connections are established by cable links to the public switched network from each area CBX and also via the private wires which are connected to the Tandem exchange. Incoming calls to the complex are also connected via the Tandem exchange, either by Direct Dialling In from the public switched network or, of course, via the private wires.

Each area has its own 3-figure code number and each telephone in an area will be allocated its own 4-figure extension number. Thus, each telephone has a unique 7-figure code similar to any direct exchange line in the London area. Within an area a call to any other telephone is established simply by keying or dialling the required 4-figure extension number. A call to an extension in any other area must be preceded by

the 3-figure code number of that area. The area code numbers are shown in each of the area boxes. Thus, for instance, a caller in Area 5 wishing to call an extension in Area 1 dials or keys code 211 followed by the 4-figure extension number of the required telephone in that area.

STD calls to anyone outside the CBX complex are established by dialling figure 9 (thereby selecting one of the lines to the public telephone system) followed by the required STD code. Calls via the public network can also be established via the operator who has a number of lines available for manual control from her console. It should be necessary to use this facility only in case of difficulty.

Incoming DDI calls are established by dialling the unique 7-figure code if in the London area, preceded by 01 if outside. For instance, anyone outside the London area dials 01-211 xxxx to be connected direct to a required extension in Area 1. Access to the private wires is also obtained by selecting the correct code. All the necessary codes will be provided to departments by CCA at the time of connection to the CBX complex.

A project of this magnitude has to be phased in over a number of years to allow optimum utilization of the available resources both in manpower and materials. Also, the installation programmes at the Tandem exchange and at the area CBXs must keep in step so that the switching capacity of the Tandem is adequate for the extra traffic carried when a CBX is connected or when it is extended after its initial opening.

Phase 1 is well on the way to completion and Tandem will then have a capacity of 2,000 switching circuits. This will allow the connection of Area 2, 6, 11/12, 14, 15 and 17 with about 25,000 extensions. Approximately 350 private wires will be connected at this stage and it is planned for completion by the end of September.

Phase 2 is planned for completion later in the year and this will lift the capacity of Tandem to about 3,500 switching circuits with about 500 private wires allowing the connection of Area 1 with its 4,400 extensions. The CBX project will therefore be about 30 per cent completed by the end of 1974.

Phase 3 is planned to increase the capacity of Tandem to 4,900 switching circuits with about 800 private wires. This allows the connection of Areas 2A, 3, 4, 5, 8 and 9 bringing the total extensions connected to about 40,000 by the end of 1975. This represents about 40 per cent completion.

Phase 4 is planned to increase the capacity of Tandem to 7,100 switching circuits with nearly 1,000 private wires allowing the growth of the areas already connected to about 50,000 extensions by the end of 1977. The project will then be about 60 per cent completed. Subsequent extensions to Tandem will increase its capacity to an ultimate total of 12,000 switching circuits allowing the connection of the remaining Areas 7, 10, 13 and 18, and carrying the traffic of about 80,000 extensions.

The capital cost of the installation is several million pounds and this is being carried by the Post Office Corporation. Recovery of this will be made in the usual way by presentation of bills to the Telecommunications Division for rental and connection charges.

With regard to accounting arrangements, agreement has been reached between the Post Office and Treasury that the concept of single customer billing should apply to the Whitehall CBX scheme. This means that the Post Office will submit only one bill for each of the area CBXs although many of them will be of a multi-user nature. It has been agreed that those bills should be submitted to the Civil Service Department as managers of the scheme.

As has already been indicated there will be quite a number of areas within the scheme each with its own CBX attracting quarterly bills from the Post Office. In addition there will be quarterly bills for the central Tandem switching exchange. It is not only the number of bills which will be presented but the size of the installations to which they relate that will present a major task in checking the authenticity of the charges raised by the Post Office. It is, however, intended to employ computer techniques for this purpose. A system has been evolved and a computer program is currently being written and tested.

All the details of each installation will be used to create a permanent 'model' file on the computer. This will embrace the automatic equipment, operating positions, extensions plan numbers and miscellaneous items, in short all the chargeable items, making up the quarterly standard rental. It will be imperative that the information in this file is kept up to date with additions, subtractions and alterations to those chargeable items. As orders are placed on the Post Office details of those orders will again be used to create an 'activities' file on the computer. This file will be used for checking the non-recurring charges on the Post Office bill and agreed items will, where applicable, be used to update the model file. The information will not, therefore, be of a permanent nature, but here again it is extremely important that details of work placed with the Post Office is continuously used as input to this record or it will prove useless in checking the bill. On receipt of the bill from the Post Office details of the non-recurring charges will be processed and a 'bill' file created.

The computer will then be used to compare the bill file with the activities file. There will, of course, be more items in the activities file than have been billed by the Post Office. Matched items will be extracted and rates and broken periods of rental checked by computer. Disputed items will be identified and taken up with the Post Office. Unmatched items will be retained in the activities file for comparison with the next bill. Details of matched items will then be used to up-date the model file and check the new standard rental being charged. In this way there will be a permanent record of the number of items being charged under the various types of equipment and making up the quarterly rental.

This, of course, depends on a continuous flow of information on orders placed with the Post Office and on work completed. Departments will continue to place orders for day-to-day items with the Post Office, but copies of these orders must be forwarded to the Civil Service Department.

Order reference numbers, in addition to showing dates and serial numbers will identify the CBX area, the Department and the building where the work is to be carried out. Acknowledgment of orders by the Post Office will quote the Post Office advice note number and it is those numbers which will be used for identification purposes in the computer system.

It is likely that the CBX scheme will be operated on a repayment service basis. This means that the Civil Service Department, having checked and paid the bills, will have to recover costs from user Departments. The only practical way in which charges for a multi-user area CBX could be apportioned is on a ratio of extensions used by each Department related to the total number of extensions on the CBX. Likewise charges for the Tandem exchange would need to be apportioned on a ratio of departmental extensions related to the total number of extensions in the whole scheme. Such apportionment would apply to both rental and installation charges. Since installation of the Tandem will be phased to keep pace with the progressive CBX installations then installation charges for each portion of the Tandem will be apportioned among the CBXs (and Departments) to be served by that portion of the Tandem.

Summarizing, the project will be about half-way to completion by the end of 1975. By then 75 buildings will be incorporated and 12 CBX exchanges will cater for about 40,000 extensions. There will be over 2,000 links to the Tandem exchange, 1,300 DDI links, 2,000 links to the public exchange network and about 800 private wires connected. About 35 manual exchanges will have been superseded and the operating staff will fall from about 600 to about 120. By the end of the decade, when the project is nearing completion, the operating staff will fall to about 100.

The Metropolitan Police MS Department

DR. N. E. HAND, Metropolitan Police Office

Introduction

Management Services Department (MSD) was set up at New Scotland Yard in April 1968 as a result of a recommendation of management consultants who had carried out a general review of the Metropolitan Police Office in the previous year. Since the early 'fifties, there had been in existence a Police Research and Planning Branch staffed mainly by police officers who had not had the opportunity for formal training in management services techniques. The management consultants recommended that the new Department should employ civil staff trained in O and M, Work Study and Operational Research, and that police officers posted to the Department should receive O and M or Work Study training.

Since 1968 there has been a modest expansion of the Department, including the establishment of a small Psychology Section. The current strength (38) is deployed as follows:

Assistant Secretary—Director
Senior Principal —Deputy Director
Scientific Officer

Administrative Section	1 HEO, 1 EO, 1 Personal Secretary, 1 CO, 1 Driver
O & M Section	1 Principal, 2 SEOs, 2 HEOs, 1 Chief Superintendent, 1 Chief Inspector, 2 Inspectors, 1 Sergeant
Work Study Section	1 Chief Work Study Officer, 2 Senior WSOs, 1 WSO I, 1 Chief Inspector, 2 Inspectors, 2 Sergeants
Scientific Section	1 PSO, 3 SSOs, 1 HSO, 1 SO
Equipment Section	1 SSO, 1 Superintendent
Psychology Section	1 Principal Psychologist, 1 Psychologist (basic grade)
MbO Section	1 SEO, 1 Superintendent

As will become apparent later, members of staff are not confined to the work of their parent section, but are often grouped into mixed teams for special projects.

The terms of reference of the Department are to carry out studies requested by any Metropolitan Police Department and approved by the Management Services Management Committee. The Metropolitan Police organization includes, as well as over 20,000 police officers organized into 23 land divisions and a headquarters administration, a large support organization responsible for supplies, buildings, vehicle maintenance, telecommunications, finance, recruiting and training of both police and civil staff, traffic wardens and school crossing patrols, Criminal Record Office, Fingerprint Department and the Forensic Science Laboratory. It can be appreciated, therefore, that the work requested can be large in quantity and diverse in type.

Once a study has been requested, terms of reference are agreed with the sponsor and a project plan and usually a short feasibility report is produced. These are submitted to the Management Committee for approval at its bi-monthly meeting. This committee is chaired by the Deputy Commissioner and consists of the Deputy Receiver (representing civil staff departments), the four Assistant Commissioners and the senior officers of Management Services Department. As well as approving projects, this committee serves as a useful communication link between senior officers of the Metropolitan Police and MSD and provides early warning of impending problems.

Requests for studies are carefully considered and the Director, Deputy Director and section heads determine the general method to be adopted and the resources to be allocated to it, bearing in mind the importance and urgency attached to the problem by the sponsor. As mentioned earlier, the various sections of MSD do not work in isolation. In some cases, a special project team is formed which may consist of members from more than one of the MSD sections. In this way, it is hoped that the limited resources of the Department are utilized in the best way. There is an added benefit in that an officer quickly learns how the methods of other sections can contribute to solving management problems. The majority of projects, however, are one-man studies and once they have been allocated to an officer it is his section head who is responsible for supervising its progress and technical content.

General problem areas

Policing is labour intensive work and unfortunately in the last few years the Metropolitan Police has been unable to increase its strength or even to maintain it at its previous level. During this period the work which the police have had to carry out has certainly not decreased. The general problem facing the Metropolitan Police is therefore to maintain, and if possible improve, the service it is providing in spite of limitations imposed by the manpower situation.

This aim can be achieved only by:

- sensible civilianization
- streamlining procedures
- eliminating unnecessary paperwork

- improving the tactical deployment of police resources so as to obtain a better match of resources to workload
- providing equipment to enhance police effectiveness
- providing better management information including statistics, so that problems are more effectively defined and resources more effectively deployed in a strategic sense.

The programme of work of MSD reflects these approaches as will be seen in the brief descriptions of the various sections given below.

O & M Section

The O & M Section has carried out studies in almost every branch of the Metropolitan Police organization. In general, police officers are allocated to problems which involve procedures in police stations and police administration, and civil staff officers tend to be allocated to projects involving civil staff functions such as supplies, finance and so on. However, this division becomes blurred because there is a considerable amount of interaction between various branches. For example, the method of recording the amount of overtime worked by police involves at first sight a study of police procedure, but in practice it requires a detailed examination of the ways the information provided is used by Finance and Pay branches, which are essentially civil staff functions. It is not unusual, therefore, to find a police officer delving into civil staff functions and vice versa.

The studies undertaken by the section range from short and fairly simple problems of forms design to large projects involving several departments. The investigation of the processing and disposal of property found in the street and handed in to police stations is a good example of a larger O & M project.

A number of problems were inherent in the former method of dealing with property found in the street. The public had traditionally fulfilled its legal obligation to take reasonable steps to identify and restore the property to its owner by handing it in at a police station. The police had always been conscious of the need to record and store this property carefully in a way which did not make it inaccessible to any of the three reliefs (shifts) on duty in each 24 hours. The result was a cumbersome paperwork procedure involving a variety of forms and store cupboards full of unclaimed property, the responsibility for which changed 21 times each week. Unclaimed property was disposed of after two months at public auction which involved further paperwork procedures, the cost of which for the bulk of the items far exceeded the amounts they realized.

The study showed that the majority of items which were restored to their owners were claimed in the first seven days after deposit at the station, and also that at the time the items were accepted by police a reasonable forecast could be made of which of them were unlikely to be claimed, for example because they had no identifying or distinctive feature and were of low value. Thus the O & M recommendation was

that the depositing member of the public should be encouraged to retain articles of this type after the details had been noted by police, and that items not retained by the finder should, if unclaimed, be retained in the station for only seven days. The result of these measures was to reduce the amount of unclaimed property in police stations by three-quarters. After the seven-day period the property was to be transferred to existing civilian-staffed local police offices from where late claimants could still recover their articles. Guide lines were also proposed for the early destruction of worthless items.

Other recommendations covered a drastic simplification of the paperwork procedure and a method of collecting unclaimed property from the civilian offices by the use of stores delivery vans which would otherwise be returning empty to their depot.

Almost all the recommendations were accepted and after a successful year's trial on one police division the new system is in use at all Metropolitan Police stations, with a considerable reduction in the time spent on safeguarding the property and maintaining the records.

An example of an O & M study carried out in the Metropolitan Police but falling wholly within the sphere of interest of the civilian staff was the study of the operation of the Furniture Stores. The advantages which O & M had, in comparison with the stores management, in tackling this study were the time to do the study without the need to keep the day-to-day work moving, a background knowledge of stores and office procedures and the availability of a broad range of MS techniques. The problems tackled involved consideration of how optimum use could be made of inadequate storage area and how delays in furniture delivery could be eradicated.

O & M studied the quantities of stock movements in recent years in order to prepare an estimate, taking account of the building programme, of demand over the next decade. This led to an estimate of future stock holdings, accommodation and staff required. At the same time, a study of both the physical and paperwork receiving and issuing procedures led to proposals for economies, part of which was to be achieved by the use of mechanical handling devices recommended by Work Study colleagues.

Study of delivery requirements led to the calculation of optimum vehicle routings by Operational Research staff, thus completing an example of how three of the MS disciplines can be co-ordinated in the solution of one problem.

Work Study Section

Whilst the professional work study officers have had a wide experience of both the public service and industry, the police staff are inexperienced in work study when they join the Department. They are given work study training at the eight weeks' residential course organized by the West of England Employers Association at Bristol. Probably because of their police background and training they are well suited to take

advantage of the course and soon become effective members of MSD.

Unlike many organizations with work study staff, the section is not pre-occupied with the problems of maintaining bonus incentive schemes. Whilst such a scheme operates in the vehicle workshops and, indeed, the section was responsible for its original outline design, a separate work study cell within the Chief Engineer's Department is responsible for its maintenance. Thus freed, the MSD work study section is able to concentrate on a wider range of problems aimed at improving the effectiveness and efficiency of particular processes and systems which need examining because of changing patterns of work and modifications to policy.

A good example of a work study project is the recently completed review of the Vehicle Removal Service. This is an essential service, although its 'customers' may disagree, the primary function of which is to remove vehicles parked in such a manner as to constitute a serious obstruction to traffic flow. The offending vehicles are taken to car pounds where the owners can reclaim them on payment of a fee. The aim of the review was to improve the efficiency of a service which had suffered a large increase not only in the size of its workload, but also in the technical difficulties of removing an increasing number of vehicles fitted with steering locks. It is somewhat ironic that a device designed to reduce a common form of crime had the effect of increasing the difficulties of the police in taking action against another frequent offence.

The main aspects studied were the extent and size of the task at present and at various times in the future, the organization, the methods used and their work contents and an evaluation of various items of equipment which could be used to assist removal crews. Recommendations were made about the criteria for selecting vehicles for removal, the drills to be employed, the size and composition of removal crews and the type of equipment which should be used. Whilst it is too early fully to evaluate the effect of the changes recommended it is already clear that 'output' (the number of vehicles removed) per crew per day has been considerably increased.

Another study is concerned with the work of CID officers on divisions where the aim is to evaluate the likely effects of different deployment arrangements, e.g., is it better to concentrate CID officers at sub-divisional Headquarters or to disperse them to sectional stations as is the current practice? The first part of the study, which has been completed, was concerned with an analysis of how the time available was split between active investigation of crimes and associated paperwork. The result of the analysis showed that a disturbingly large proportion of time was spent on paperwork much of which did not strictly require a CID officer for its completion.

As a result of this part of the study an experimental organization has been set up on two sub-divisions to provide a support group so that CID officers may be freed from certain duties and to make available to

them more time for the investigation of crimes. Work is continuing on the second stage of the study which is concerned with the advantages and disadvantages of centralization. Clearly, the CID support group is economically more viable if CID officers are concentrated at subdivision, but there may be operational and administrative penalties in this arrangement, and current work is aimed at evaluating these.

Other work of the section is concerned, *inter alia*, with the interior design of Scenes of Crime Officers' vans, the layout of the main traffic control room at New Scotland Yard, the reorganization of the Photographic Branch, extensive work involved in the conversion of Criminal Record Office from a mainly hard copy file library into a predominantly microfilm library, and an analysis of the work performed by traffic wardens which will form the basis of a management information system.

Scientific Section

The Scientific Section has two major areas of interest, namely, general Operational Research and the design and development of computer systems in the management information field. A subsidiary function of the section is to provide mathematical and statistical support for the Department as a whole.

So far as general OR is concerned, the scientific staff tend to be more involved in the mixed teams dealing with the larger projects. The project on married quarters which will be described later is a good example of the sort of work carried out by the section. Other projects recently undertaken include a study to improve the utilization of manpower resources used for uniform patrol on divisions, the development of performance measures in relation to criminal investigation, the development of models to predict future workloads in the Criminal Record Office and optimum route scheduling for the Despatch Van Service.

In the computer systems field most projects arise from general OR studies or surveys which recommend the development of a management information system. It must be emphasized that MSD is not responsible for ADP services which are the responsibility of the Joint Home Office and Metropolitan Police ADP Unit. However, a major role of MSD is to define the operational requirements of the users when a computer solution is indicated, and quite often this involves outline systems design and considerations of feasibility and cost effectiveness before a formal request for a computer service is submitted.

The section has recently been responsible for the definition of the operational requirements of the Criminal Investigation Department for record retrieval and intelligence, and will continue to play a major part in the co-ordination of the detailed design and implementation of the proposed system if it is approved.

Several years ago, as a result of a major OR study into the routine administration of the Metropolitan Police vehicle fleet, a computerized

management information system was designed with the objects of providing the following facilities:

- optimized vehicle replacement policies
- accurate costing data
- scheduling of vehicle maintenance
- vehicle utilization controls
- bonus calculations for the workshops' incentive scheme
- stores inventory and stock control

In this case, the section together with the Chief Engineer's Department and the Joint ADP Unit has been responsible for the implementation of the whole scheme. Progress has not been as fast as had been hoped largely because of the difficulties encountered in fitting a sophisticated on-line system into an overloaded and essentially batch process orientated computer configuration. However, full implementation is now in sight.

Psychology Section

The small Psychology Section was originally set up in the police personnel department to advise and assist on the initial selection screening (including intelligence and aptitude testing and interviewing methods) of applicants to the Force, selection procedures for promotion and transfer, annual reporting procedures, training aspects and a wide range of problems which involve a 'human factors' element. This Section was later transferred to MSD.

The Police Initial Recruitment Tests which the section has developed have been used as an aid to selection in the Metropolitan Police for more than three years, and recently the tests have been introduced for all police forces in England and Wales. There is a continuing need for the tests to be validated and, if necessary, modified, and for parallel versions to be developed.

An important study completed last year was an investigation into the reasons for the heavy premature retirement of police officers from the Metropolitan Police. In 1972 for the first time ever the force had fewer officers at the end of the year than it had at the beginning and this trend appeared to be accelerating in the first few months of 1973. It was decided, therefore, to carry out a study aimed at isolating the reasons for this state of affairs.

All police officers who resigned from the Force in the first six months of 1973 completed a questionnaire regarding their reasons for leaving, the job to which they were going, their police background and training and their attitudes to various aspects of police work, such as discipline, pay and so on. A similar number of officers who had not at the time expressed an intention to resign and who were comparable in age, rank and length of service were also asked to complete a questionnaire on their attitudes. The results of the study must for the present remain confidential. However, they provided a considerable amount of

valuable information and a number of recommendations which, if implemented, should go some way to reducing wastage.

The section is also involved in studies in the field of training, particularly with regard to operators of computer terminal equipment and other console equipment. An important field for investigation by psychologists is that of community relations and recently the staff has been asked to assist with the analysis of situations which give rise to complaints against the police by members of coloured communities. Like the scientists, the psychologists provide general psychological advice to the rest of MSD, for example in relation to the design of questionnaires and on ergonomic aspects of equipment.

Special projects

A good example of the team approach is a study which was carried out in relation to the administration of the Metropolitan Police Married Quarters Estate. This Estate consists of about 4,500 flats, maisonettes and houses located over the Greater London area. Initially we were asked to explain how a situation had arisen whereby the proportion of empty married quarters had risen sharply over a two-year period whilst the waiting list for quarters had not decreased significantly.

A preliminary survey revealed that during 1971 and 1972 many police officers were caught up in the general house buying fever which swept the country at that time and had vacated married quarters to purchase their own houses. Unfortunately, whilst individual officers concerned with the various aspects of the administration and maintenance of married quarters were aware of the situation, the relevant information was not concentrated at the point where effective decisions could be made. This led to a slight reorganization of the reporting links and the placing of the decision-making responsibility at the appropriate position in the hierarchy.

The survey also indicated that the mechanisms involved in the vacation, maintenance and allocation of married quarters resembled a simple classical queueing model. A queue of applicants was awaiting a service (allocation of quarters) which involved delays imposed by the availability of empty quarters, the need to carry out maintenance, modernization and decoration, and the administrative procedures of offering quarters to applicants, having them accepted and, finally, having the applicants move in. A simple mathematical relationship between vacation rates, maintenance and administration times and the rate of allocation was developed and from this it was possible to determine, for the conditions then prevailing, the minimum size of the married quarters estate needed to keep the queue of applicants and the time spent awaiting allocation of quarters to the desired levels. It was also possible to determine the effect on the length of queue and waiting times of increasing or decreasing the maintenance resources, which is useful information for the architects and engineers. A work study exercise aimed at streamlining the maintenance procedures has been

proposed but has not yet been carried out.

It was then decided to use the queueing model as a basis for a management information system to assist the joint committee responsible for all aspects of married quarters administration. In January 1973 the information system became operational and monthly outputs for each of the four police administration areas of London were produced. MSD undertook to produce the information until such time as they could be produced by an administrative group. Given the appropriate data, the time taken to produce the information was less than a day.

However, the abstraction of data from the various sources and its reconciliation was far more time consuming. This led to the initiation of an O & M study aimed firstly at ensuring that the information used throughout the organization was consistent and, secondly, at simplifying the storage and retrieval of records. As a result minor changes in organization and extensive changes in methods of storing data have been recommended.

A major effect of the introduction of the information system has been that decisions regarding the disposal of surplus quarters can be made with much more confidence and indeed within the first six months over 600 quarters were earmarked for disposal. The information system also revealed that the geographical locations of the quarters did not adequately match the distribution of demand and studies have been undertaken with a view to remedying this problem. Furthermore, differences in preference for houses, flats and maisonettes, and in their locations also became apparent.

Of course, the location of married quarters depends not only on the choice of police officers wanting to live in them, but also on the operational and administrative needs of the Force. Married quarters in central London are not, in the main, popular with police families, but it is essential to have some policemen living in that area, partly to enhance the police response in the event of an operational emergency and partly to reduce the travelling time incurred between home and place of duty. If, then, quarters must be provided in central London what features, such as fittings and fixtures, should be provided in order to make them more attractive to police officers?

The Psychology Section together with two experienced police officers from the O & M Section was asked to undertake an occupants survey to determine preferences not only for type of quarter, fixtures and fittings, etc., but also for location, social and educational facilities and various other aspects considered to be of value. A report on the survey has recently been completed and is proving to be of considerable help in the re-development of the married quarters estate.

An interesting by-product of this work is that MSD is permanently represented on the committee responsible for the administration of married quarters and through this representation is continuing to assist the committee by interpreting the output from the information system and arranging for further studies to be carried out as necessary.

In this whole project, every section of MSD made contributions which were carefully co-ordinated by a senior officer of the Department who acted as overall Project Manager and who kept in close contact with the officers responsible for administration.

Other studies which have involved the use of mixed teams include the optimum location and functions of police stations and the allocation of police manpower resources.

There can be little doubt about the effectiveness of the mixed team approach. Each part of a study can be carried out by officers with the proper training and experience to do so. Thus the Department's resources are used effectively and all officers quickly become aware of the advantages and disadvantages of disciplines other than their own. Since this method of working was introduced the amount of consultation between sections, even in relation to the smaller projects, has increased enormously with a corresponding increase in the quality of the work done. There are, of course, some disadvantages, the main one being that heads of sections are not in control of all the officers in their groups, although they are still responsible for the technical quality of their work. On balance, we believe the advantages far outweigh the disadvantages.

Management by Objectives Section

The small MbO section is concerned with the implementation of MbO in Transport Branch of Chief Engineer's Department. In addition, a consultant is available to assist the team when advice is needed. The scheme is regarded as an experimental 'test-bed' from which it is hoped to draw conclusions about the application of MbO in other parts of the Metropolitan Police organization.

For a number of reasons, largely outside the control of the team, progress has been slow and not without its difficulties. Nevertheless, the Chief Engineer has expressed his satisfaction with what has been done so far, and has already made a number of organizational changes in Transport Branch which were indicated as a result of the development of managers' guides.

Equipment Section

The Equipment Section was originally set up to define the need for items of equipment to satisfy particular police operational requirements. Once a need had been defined, the function of the section was to find equipment which appeared to satisfy the requirements and to test it under operational conditions. The section did not undertake research and development although it has commissioned such work from government laboratories and private industry.

Over a period of three years the section accumulated a considerable amount of specialist equipment which became in great demand for operational purposes. The effect of this was that the small staff of the section became fully employed on operational matters at the expense of its proper function of testing potentially useful equipment. About two

years ago, therefore, it was recommended that an operational special equipment unit be set up to satisfy operational demands and that the Equipment Section in MSD should revert to its original function. Now that the section has been freed from the need to undertake operational work, it can devote more time to controlled experimentation, to considerations of cost/effectiveness and to monitoring of technological developments in order to find possible longer-term solutions to police requirements.

Equipments under test at present include explosives detectors, image intensifiers, lighting systems for scenes of major incidents and portable signs for use at scenes of accidents.

The Force suggestion schemes

MSD evaluates all suggestions submitted through both the Police and Civil Staff Suggestion Schemes, which annually total about 300 and 40 respectively. Both schemes now provide for monetary awards for suggestions which are considered to be of significant value to the Metropolitan Police Office. The evaluation of suggestions needs to be carried out with care and it is vital to maintain records of all suggestions received and of the outcome of the evaluations. Sometimes a suggestion leads to a major project for MSD.

All officers of MSD deal with suggestions although inevitably the biggest loads fall upon the O & M and Work Study sections. By far the largest proportion of suggestions is concerned with forms design and police procedures in police stations.

Past and present performance

The Department has produced each year between 30 and 40 formal reports on major projects and over 500 short notes mainly on Force Suggestions and in relation to papers circulated for comment. About 90 per cent of the recommendations made in formal reports have been accepted. However, that figure is not a particularly good performance indicator because it is heavily biased by the high proportion of O & M reports, the recommendations of which invariably have a very high acceptance rate. On the other hand, the recommendations of a feasibility study on, for example, a sophisticated management information system often serve only as a basis for discussion and may as a result be modified considerably. A better indication of acceptability and possibly of performance is that the volume and range of studies requested has shown a generally increasing trend.

Acceptability, however, is not uniform over the whole Metropolitan Police organization. In the nature of things a satisfied customer is more likely to return than a disappointed one and the content of the work programme becomes biased. The new MSD Management Committee should provide a means of restoring balance into the programme.

MSD is a relatively young department. It may be regarded as being in an adolescent phase and like all adolescents it is striving to find its proper place in the adult world.

Management Accounting and Information System for CSD

R. E. CORRIGAN, Civil Service Department

When the Civil Service Department was established in 1968 its expenditure was contained in three Votes: the main CSD Vote, the Government Hospitality Vote and the Royal Commissions Vote. They had an overall value of about £7 million, and the main Finance Division accounting commitments were for book-keeping and Estimates. There was a minimal need for management accounting information, this being confined to *ad hoc* costing activities performed by some groups of divisions for repayment or project control purposes. Finance Division was not generally called upon to provide reports for these purposes.

In recent years the duties of Finance Division have grown with the increase in the size and functions of the Department, especially after the Chessington Computer Centre (CCC) became part of the CSD in April 1972. 1972 was a critical year when a number of new factors coincided, but the creation in the first half of the year of the Central Computer Agency (CCA) and the Civil Service Catering Organization (CISCO), each with its own Vote, really brought matters to a head. Both would require sophisticated book-keeping; and CISCO in particular, due to the commercial nature of its operations, would require accurate and up-to-date management information reports derived from the accounts. An entirely separate factor which also cropped up in 1972 was the requirement for the Estimates for 1974–75 and beyond to be analysed by programme as well as by function.

To gauge growth by quoting figures of the number of transactions processed can, of course, be misleading as frequently the amount of work involved in paying £100 is as great as that involved in paying £1 million. It does, however, serve to illustrate in some measure the way in which the workload has increased. In mid-1969 it was estimated that the annual volume of transactions processed was about 65,000; by the date of implementation of the new system this had risen to about 186,000. In 1969 the number of payable orders issued annually was approximately 60,000; by the end of 1973–74 this had become 100,000.

Although there had been a good deal of informal discussion with the domestic O & M Branch of CSD and with MS (Accountancy) Division, it was not until the summer of 1972 that Finance Division were able clearly to see the extent of their future requirements and an urgent operation was mounted to consider the basic accounting requirements

of the Department. The terms of reference required the introduction of an accounting system covering all financial transactions which would also provide a system of management accounting for use initially in CISCO and CCA and elsewhere as appropriate. It was also agreed that in undertaking this work:

(*a*) Account would be taken of possible new developments in the field of budgetary control, costing and resource allocation within CSD.
(*b*) A framework should be established which would be capable of accommodating possible developments of CSD activities.

The proposed accounting system would need to fulfil three main objectives:

(*a*) Reports for Vote accounting, providing figures for control purposes during the year (i.e. monitoring actual against the estimated expenditure) and providing the necessary accounting records to produce an appropriation account at the end of the year.
(*b*) Reports for management information purposes to provide figures for decision-making (e.g. the profitability of CISCO staff restaurants) to enable control by reports to management in two forms: analysis of results by organizational units, and analysis by project.
(*c*) Produce payable orders. The system would be required to produce payable orders and remittance advices where applicable, and at the same time produce an order schedule on magnetic tape for transmission to the Paymaster General.

With the resulting objectives of the study in mind the project was organized in the following manner.

First, a Steering Committee was established on which were represented the various bodies interested in the study. The Committee provided an invaluable forum, means of control and a source of guidance and support to the study team. It was agreed by the Committee that the study should be undertaken in three phases:

(*a*) First, a survey. This lasted three months and was carried out by an SEO from MS (Accountancy) and a Coopers and Lybrand senior consultant. They looked at the CSD activities and problems and recommended the *structure* of the proposed accounting system and the *means of processing* the data—both necessary to meet the objectives. These recommendations were then discussed with interested parties and then, in their final form, adopted by the Steering Committee as the basis for the subsequent phases.
(*b*) The second phase covered the design and testing of the system. This involved designing the clerical and accounting procedures and computer system and lasted from January to October 1973 and was carried out by a joint MS (Accountancy), CCC and Coopers and Lybrand team under the leadership of one of the senior consultants. The team set themselves what many considered to be an extremely tight programme to get the system operating in time to handle

October's data. This was achieved only by most meticulous and detailed planning, weekly progress reviews, regular meetings of a nucleus of the Steering Committee and the greatest possible help and co-operation from all involved.

(*c*) The third phase was concerned with implementation and development. The manual and computer systems were run in parallel for most of October and the system became fully operational in November 1973. There are a number of features of the system not presently used and these will be gradually introduced as the need for them emerges.

Now for the system itself—its principal features are:

(*a*) It processes all accounting transactions, produces payable orders and maintains the basic accounting records.

(*b*) It provides for the direct transfer of staff cost information from the CCC payroll system by means of the Pay Exchange programs, which select all CSD entries on the payroll and make the appropriate transfer to the computer ledger file.

(*c*) It provides the analysis by Vote programme and a comparison of actual expenditure against Estimates—revised where necessary.

(*d*) It provides an analysis of expenditure (and income) both by organization and by project, again against Estimates, for use in accountable management, in the broad sense, and for the more detailed planning and control necessary in areas such as CCA and CISCO.

(*e*) It is *one* system; in other words, the management accounting and Vote accounting are fully integrated and are drawn from the same basic data. This ensures consistency and economy.

(*f*) It is flexible—it not only provides the facility to accommodate new CSD activities when and if they arise, but it can be adapted easily to organizational changes, programme changes and new information needs.

(*g*) It is comprehensive—it not only processes all the figures involved in Vote accounting, but it also handles expenditure, income, assets and liabilities not currently reflected in the CSD Votes but which are needed for effective management planning and control; for example, it caters for stocks and accrued payments. In this way it can provide information on all the costs of an activity for effective resource management, planning and control, including manpower planning.

To achieve all this, the system has three main elements:

(*a*) An accounts code.

(*b*) A data processing (computer) system for handling the data, analysing it and producing reports.

(*c*) A set of explicit procedures setting out *when, how* and *by whom* each action should be initiated.

The accounts code is the means of ensuring that the Vote, organization and project reporting can be achieved. To do this every transaction is coded. The form of the code is:

Organization code	Cost element code	Vote indicator	Project number
31531	116	V	9234567

(*a*) The first part is the *Organization* code which identifies the section responsible for each transaction, and thus the total costs and income which are the responsibility of each Section, Branch and Division Head through to Under Secretary, Deputy Secretary and, finally, to the Permanent Secretary for the Department as a whole, can be readily ascertained. In the example, the first digit 3 represents a Deputy Secretary command, CCA is 31, the Central Computer Bureau (CCB) is 315; 3153 is Progress within CCB; and 31531 is the Sovereign House Progress Section within CCB.

(*b*) The second part enables the *nature* of the transactions to be identified individually and as monthly and year-to-date totals, within each Vote, organization and project. For example, this part of the code distinguishes between staff costs, appropriations-in-aid, assets and liabilities. In this example, 1 covers all staff costs, 11 is staff salaries and 116 is staff overtime. These items, such as overtime, are called *cost elements*. As earlier, some cost elements are not included in the Votes, for example, stocks, and more can be introduced—for example, fixed assets and depreciation—when appropriate. To distinguish the Vote and non-Vote cost elements, the third part of the code is used—V for Vote and E for external-to-Vote.

(*c*) The fourth part is used when expenditure is incurred on a project. Projects present a problem because you have a three-way responsibility—that of the section incurring the expenditure, i.e. the 'contractor' (e.g. Sovereign House Progress within CCB), that of the project leader responsible for project 9234567 and for some projects that of the 'customer' who has commissioned the work. The use of this code allows reports to be prepared reflecting these responsibilities. So now it is possible to identify the costs by 'contractor' section (31531), the nature of the expense (116) and the project it is spent on (9234567). The project report will show the nature of cost spent on each project by each contractor and, by use of a recharge facility, the project number, 9234567, can be tied to a 'customer' and a report on expenditure by customer prepared.

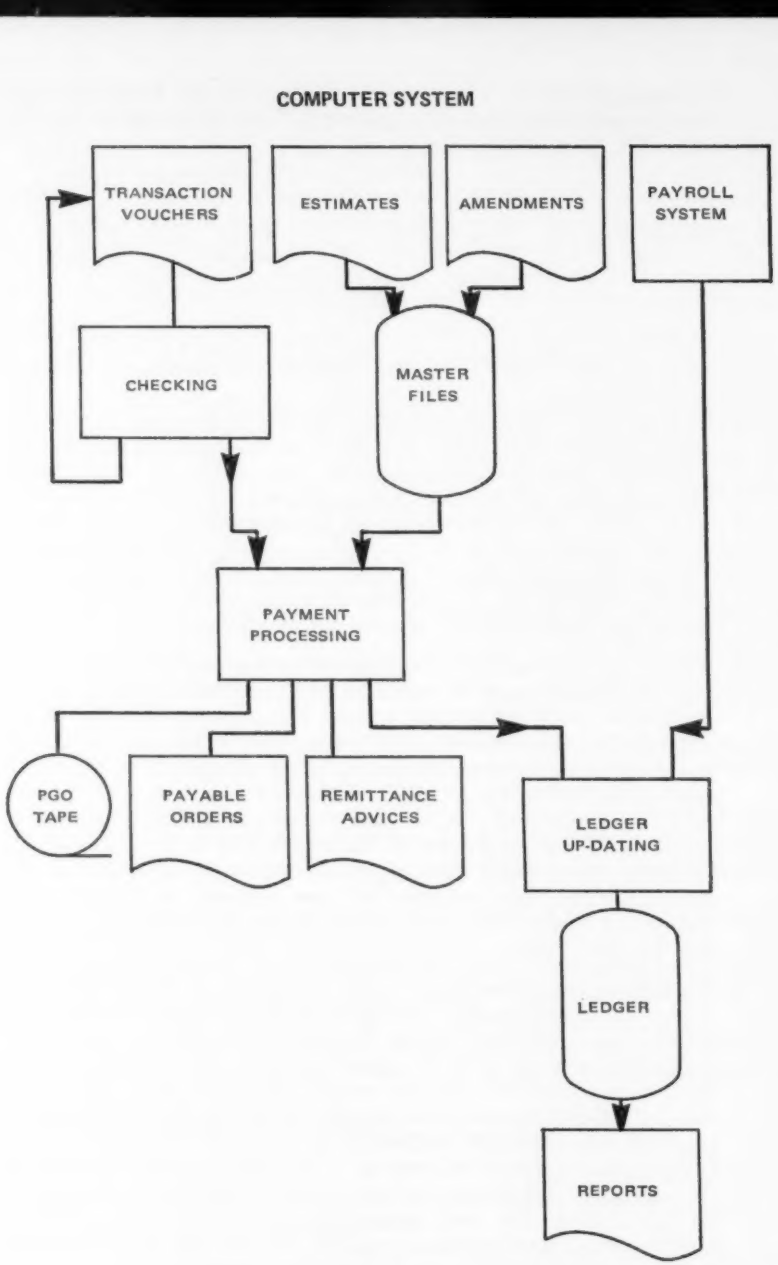

COMPUTER SYSTEM
TRANSACTION VOUCHERS
ESTIMATES
AMENDMENTS
PAYROLL SYSTEM
CHECKING
MASTER FILES
PAYMENT PROCESSING
PGO TAPE
PAYABLE ORDERS
REMITTANCE ADVICES
LEDGER UP-DATING
LEDGER
REPORTS

FIGURE 1

At the present stage of development of the system there is a limitation in the use of the project facility, in that it is not possible to allocate staff costs to a project code. The apportionment of staff costs to projects would require additional programming plus the introduction of a time recording system (time sheets) for the staff for whom this information was required.

The fifth part which is not shown on the above example is for the Vote or Vote programme. It never has to be entered against individual transactions because each combination of organization and cost element is unique to one Vote programme and so we use the computer to insert the relevant code for us. In this case, 71 is the Computers and Telecommunications (Class XIV, 4, A) Vote programme code against which CCB expenditure is charged.

To minimize staff effort, as much pre-coding as possible will be used to operate this accounts code.

The structure of the system in a considerably simplified form is shown in *figure* 1. Master files hold the estimates and the organizational/cost element code and Vote programme look-up tables. The data from the coded transaction documents is punched, checked and processed to verify its validity and, where appropriate, is used to produce payable orders, remittance advices and the PGO's data. This data, plus the information from the payroll system, is then used to up-date the ledger which in turn holds the basic coded accounting data. The data can be analysed in the way already described to produce Vote accounts, project reports and organizational cost statements, summarized to reflect different levels of responsibility. All of these can be analysed by cost element and, in all of them, the actual figures are compared with Estimates for this month and the year to date, and, all the time, the results will be consistent as the system uses the same basic data each time. Of course, the ledger also provides the very basic records of transactions needed for accounting and audit purposes.

Finally, the procedures; these have all been written, discussed and issued.

To sum up, CSD now have working a management accounting system which took a little over 12 months from initial survey to implementation. It can handle all the volume of transactions the Department could conceivably expect to get in the foreseeable future; it can analyse information and produce reports which meet traditional government accounting requirements; it can cope with the new form of Estimates and with the adoption of repayment relationships with other Departments; and it allows the compilation of commercial-style accounts.

These objectives could have been achieved by other methods, but the one adopted will be the most economical. It will show a net saving in staff; for example, at a conservative estimate some 28 fewer clerical grades will be needed to do book-keeping for CISCO directly managed staff restaurants. Another important economy is that the ADP work can, to a large extent, be accommodated at CCC, in the troughs of the

payroll processing schedule, with minimal additions to the staf complement, although inevitably CCC resources are under stress whe the payroll processing hits its peak.

Certain CSD Divisions are already planning to use the system to cos and compare divisional functions. Work done for other Governmen Departments, either as an allied service or on repayment, can b evaluated if desired. As the system develops it will be possible to compar the cost of doing the same thing in different ways—for instance, usin in-house resources as against outside services for specialized training o recruitment. These ideas are not novel, of course, but implementatio will be much easier than before when a costing exercise took a con siderable time to carry out.

Finally, CSD Management Services (Accountancy) Division hav been fully involved in the development of the system—both in providin a specialist assignment officer and in giving advice and guidance on th Steering Committee. Their help has not been disinterested, of course because they have always seen this project as having a possible wide application in the Service.

HMSO Reprographic Centre, Basildon

F. J. MEADS, Her Majesty's Stationery Office

The HMSO Reprographic Centre at Basildon provides a comprehen sive reprographic service to all Government Departments in south-eas England, including the London area, and a microcopying service t all Departments in England and Wales. The purpose of this short articl is to remind departmental clerks of stationery, and to advise Manage ment Services staff and management in general, of the extensive rang of services offered by the Centre.

- *Copy preparation.* The Centre has the facility for preparing typed masters in various styles for bookwork and formwork; and for producing offset-lithographic masters from direct image platemakers. Thre process cameras are available for making line and half-tone negative for printing down on metal plates.

- *Offset-lithographic printing.* Offset-lithographic printing, on a wid range of paper and board stock, and up to A3 size, is produced usin a large battery of machines.

- *Photographic.* On the photographic side, the Centre has a steady flow

of customers wanting bromide prints, statfile negatives and prints and, to a lesser extent, photostat prints. A new service now being offered is the production of transparencies and multi-colour overlays for use with overhead projectors.

● *Microcopying*. The Centre is geared to provide a microcopying service in 16 mm, 35 mm and microfiche formats, and can produce jacketed film, aperture cards and diazo duplicates. Filming and processing is subject to strict quality control.

● *Name plates*. The Centre has the facility for producing name plates, door cards, etc. Permanent images can be produced on either card or plastic, in a range of colours.

● *Plan printing*. Plan printing on large diazo printers, from film, linen or paper translucents, is another requirement the Centre can satisfy. Photocopying up to A3 size is also offered.

● *Addressing*. Some 80 staff are engaged on production in the Centre's addressing section. The title is, perhaps, something of a misnomer in that the equipment is capable of much more than straightforward addressing work, i.e. putting names and addresses on to pieces of paper or card—envelopes, labels, letters, acknowledgment cards, etc. Examples of other work carried out by the section are: production of payrolls, pay slips, wages envelopes, payable orders, pension books; printing on to fanfold stationery; and overprinting supplied documents. The 'master' used is a metal plate on to which can be embossed a maximum of nine lines of type, each line containing up to 44 characters, alpha or numeric; the data embossed does not, of course, have to be names and addresses. The data can be up-dated as necessary; all or part of the data on a particular plate can be printed; all plates in a 'set' can be printed, or a selection made; and as many copies as needed can be produced. From the cost angle, six prints from any one 'address' in a year justifies the use of some form of addressing service. Regular and repeat orders can be placed on annual running demands to ensure that Departments always have an appropriate stock in hand.

● *Warehousing*. With all this production the Centre needs a warehouse to finish, pack and despatch. Again, some 80 staff are engaged on cutting and trimming paper, books and card, putting covers on bookwork, perforating, stitching, punching holes, numbering, folding, and gathering and collating something like 9 million pieces of paper each month.

Specialists in the various areas of the Centre's activity are available to advise Departments on their needs; and the Centre would be pleased to welcome visitors to its offices to explain the services available in greater detail. The telephone number is Basildon (STD Code 0268) 22701.

Computer Installations for Government Departments

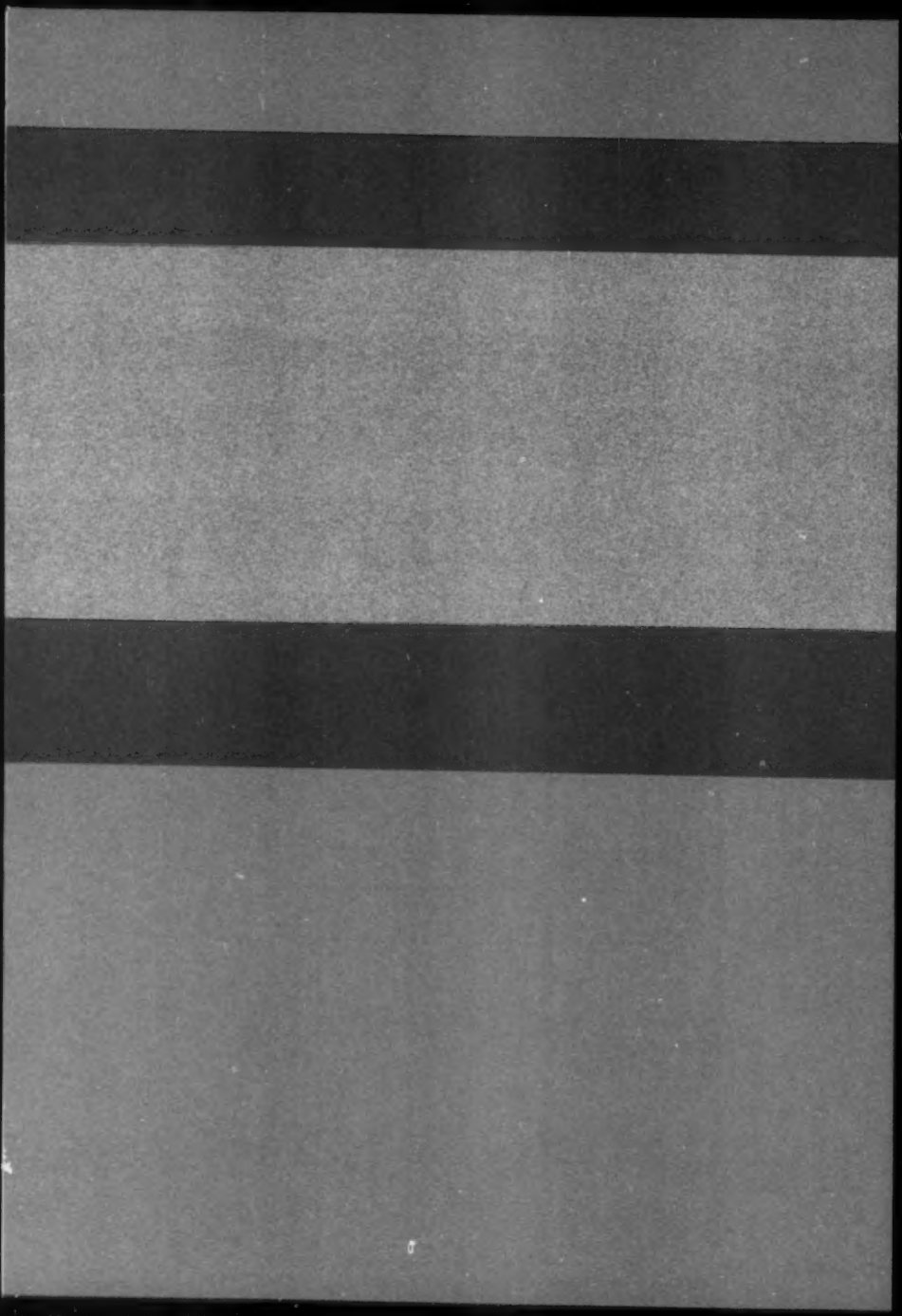
A list of all Government computers as at 1st January 1974 was published as a supplement to the May 1974 edition of MANAGEMENT SERVICES IN GOVERNMENT. Details of computers ordered during the period January to March 1974 are shown in the following table.

DATE OF ORDER	DEPARTMENT[1]	LOCATION	MAIN USES	MANUFACTURER[2] AND TYPE OF COMPUTER
1B Computers on order for administrative and general purposes				
January 1974	DNS	Lytham St. Annes	Bond and Stock payments and repayments	ICL 4/72
March 1974	MOD (Central)	Bath	Accounts	ICL 1903T
March 1974	MOD (Army)	Worthy Down	Army pay	IBM 370/158
2B Computers on order for scientific and technical purposes				
February 1974	Department of Energy	Sheffield	Safety in mines research	DEC PDP8F
February 1974	MOD (Air)	Harrogate	Logistic control of aero engines	BCL Molecular 18
March 1974	DTI	Cambridge	Computer-aided design	Prime 300
March 1974	DTI	Cambridge	Computer-aided design	DEC PDP11/12
March 1974	Department of Energy	Sheffield	Safety in mines research	Varian 620L

[1] Department Key (*Column* 2)

DNS	Department for National Savings
DTI	Department of Trade and Industry
MOD (Air)	Ministry of Defence (Air)
MOD (Army)	Ministry of Defence (Army)
MOD (Central)	Ministry of Defence (Central)

[2] Manufacturer Key (*Column* 5)

BCL	Business Computers Ltd.
DEC	Digital Equipment Corporation (UK) Ltd.
IBM	International Business Machines (UK) Ltd.
ICL	International Computers Ltd.
Prime	Prime Corporation of America (UK) Ltd.
Varian	Varian Associates Ltd.

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